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TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

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THE TREATMENT OF DYSENTERY.

Delivered before the Royal Society of Medicine on Dec. 20th, 1915,

BY LIEUT.-COLONEL SIR RONALD ROSS, K.C.B., F.R.S.,

RECENTLY CONSULTING PHYSICIAN ON TROPICAL DISEASES, MEDITERRANEAN EXPEDITIONARY FORCE.

MR. PRESIDENT AND GENTLEMEN,—My object in this lecture is not to detail my own experiences and opinions upon the very large subject of the treatment of dysentery, so much as to elicit the experiences and opinions of the many medical men who are at present treating cases in Britain, in order that we may be able to compare notes, and, if possible, to consolidate our methods in this important branch of practice. Fortunately, for some centuries past Britain has remained almost entirely free from this serious disease, and probably entirely free from the amœbic form of it, except in regard to patients who have been infected elsewhere. The result has been that medical men in England have not been able themselves to collect experiences, and now perhaps find themselves called upon to treat large numbers of cases suffering from a malady with which they are not familiar. But we must remember that nothing in the whole range of clinical practice requires greater experience, skill, and judgment than the treatment of dysentery in all its stages. In fact, this subject has been almost the principal preoccupation of physicians in Egypt, Greece, and Italy and other warm climates for thousands of years.

TREATMENT OF DYSENTERY IN THE PAST.

In classical times the treatment, of course empirical, consisted largely of the use of oils, essential oils, wine, and dieting, not to mention some of the curious remedies which our predecessors were apt to advocate. In what may be called the first work on tropical medicine—namely, that curious book "The Cures of the Diseases in Forraine Attempts of the English Nation," 1598, and recently republished by the Clarendon Press, and attributed to one George Wateson, who apparently gave his manuscript to Richard Hakluyt, we find the following instructions:—

> To cure Las Cameras, or Cameras de Sangre, which is the Bloodie Flux. With the more expedition, that medicine is ministred to the diseased of Cameras de Sangre, Laxativenes, or Bloodie Flux, there is the more possibilitie it should prevaile. And detracting it, the Pacients often die suddenly, without feeling much griefe. For speedie and assured remedie thereof, the Pacients bodie must bee clensed of the slimines, engendered in the passages of the nutriments; before anie sustenance can remaine in his bodie. And for that purpose, give to purge him in the morning, halfe a pint of white Wine coold, wherin ½ ounce of Rubarb hath been sodden, being small cut; putting in some Suger Candie to sweeten it. And Immediately after he hath so purged, keepe at his navell Rosemarie sodden in strong Vinegar, applied in the morning and evening verie hot, untill it be stayed: giving him often Quinces brused and rowled in Marmelet like Pils, which hee should swallowe whole, and none of the Fruits, or meates before recited, nor any more white wine, but red wine of any sort. And if it be on Land, the livers of Goates (especiallie) Sheepe, or Bullocks rosted: not willingly permitting the Pacient to eate any other meate. And if at Sea, Rice only sodden in water, rather than any thing else usuall there, untill the infirmitie is perfectly asswaged.

Sydenham used to employ venesection followed by purgation and laudanum administered in a cordial, his treatment being based upon his pathogenical hypothesis that dysentery "is a fever turned inwardly on the bowels." Early last century calomel was much employed. Morehead in the middle of last century still supported the use of blood-letting and calomel, but added ipecacuanha, and, of course, used blisters and fomentations.

IPECACUANHA.

The most important event in the history of the treatment of dysentery was the employment of ipecacuanha which was first advocated in 1600 and then described by Piso and Marcgraf in 1648. Later in the same century the Dauphin, son of Louis XIV., was successfully treated by Helvetius with ipecacuanha, which he had obtained from Brazil, and Helvetius obtained a great reputation by the use of the drug, which he kept a secret, though he was ultimately prevailed upon to disclose the secret for a sum of a thousand louis d'or. Since then the fortunes of ipecacuanha have varied from time to time, just as did the fortunes of cinchona bark. At times vaunted as specifics, and at times condemned as useless, probably both drugs suffered much from being given in quite inadequate doses and for periods which were too short to compass complete cure. The use of large dosage seems to have been revived by Balmain at the beginning of last century, just as the use of large dosage of quinine was revived by Maillot some years later. Balmain prescribed up to two drachms of the powder, with 60 drops of laudanum, and claimed that one or two of these doses were often sufficient to establish complete cure. I am not sufficient of a medical historian to know whether the credit was due to him or to Docker, but it is often maintained that the latter was the first really to claim the rank and title of specific for ipecacuanha in dysentery—which was something to have done, and for which he received a special pension by the Government of India.

EXPERIENCE OF DYSENTERY IN INDIA.

In the year 1881, when I entered the Indian Medical Service and went to Netley, ipecacuanha was certainly in high favour, and I remember the fine lectures on the subject given by Surgeon-General McLean. No one more strongly emphasised the wonderful powers of ipecacuanha, not only in dysentery, but as a preventive of hepatic abscess, even after the pus had begun to form. I believe that all of his hearers (young men at the time) followed out his teaching in India afterwards. He insisted upon massive dosage in spite of the frequent vomiting caused by it, and, so far as I remember, gave the drug the last thing at night on an absolutely empty stomach (if possible) and on a previous dose of opium. At any rate this may also be described as the usual Indian treatment up to the days of emetine. I suppose that there are few medical men in Indian practice who do not every day of their lives have under treatment at least half a dozen cases of acute or chronic dysentery; so that our experience was certainly large.

Personally, I am a convinced believer in the specific value of ipecacuanha. When I was staff surgeon at Bangalore I saw many cases of severe dysentery in officers returning from Burma and the Mofussil, and never dreamed of treating such without this drug. I remember particularly one such officer who was, we all thought, dying when brought in. The first dose of ipecacuanha powder

was vomited, but the second was retained, and the patient's recovery began next morning and was complete. We used to repeat the ipecacuanha at least once a day for about a week or more in spite of vomiting; but, of course, patients often became habituated even to large doses in three or four days. Later on I used to prefer giving opium every night, and the dose of ipecacuanha in bolus with a single mouthful of milk at about 4 o'clock in the morning, if a nurse to give it was available; and the patient was not allowed anything either to eat or to drink until about 9 A.M. I thought that with this method one daily dose sufficed. Later in the case we used to combine 5 or 10 grains of tannic acid with the ipecacuanha, especially in cases of "running dysentery"; but I believe that practice was generally opposed to the use of astringents until the disease had first been mastered by ipecacuanha. Of course, in those days we did not know whether the dysentery was amœbic or bacillary, and gave ipecacuanha in both; and up to the present I am not by any means convinced that ipecacuanha is of no benefit in bacillary dysentery. The extraordinary specific effect which it has upon the mucous membrane of the stomach and colon especially suggests that it may at least be partially destructive to the vegetable parasites as well as to the animal ones.

I do not think that we used bismuth much in those days, nor calomel, nor the sulphates of sodium and magnesium. And many of us were certainly opposed to enemata, at least in very new cases, as we thought that they were likely to have an irritating effect similar to that often produced by catheterisation. Here, I admit, opinion differed largely, and I remember many cases in which enemata certainly did not kill the patient, although in acute cases they undoubtedly cause much depression and considerable pain. I also remember a few cases in which I thought that ipecacuanha had stopped the progress of commencing hepatic abscess—and also some, I fear, in which it failed to do so.

In cases of chronic dysentery—cases whom we often found extremely difficult to treat, and indeed who have often become chronic simply because they refuse the treatment advised by their medical attendants—ipecacuanha was often given daily for some weeks, was then remitted for another week or so, and commenced again, and so on. There were many retired officers in Bangalore suffering from this disease and from sprue, and the difficulty of the physicians almost always lay in dealing with the patient as much as in dealing with the disease, and everyone knows the state of irritability and impatience to which chronic dysentery and sprue reduce their victims. In *chronic* dysentery enemata were, of course, much more certainly used than in acute dysentery, and nitrate of silver was almost a classical drug for the purpose. We heard nothing in those days of appendicostomy, but dieting was a science in itself, requiring not only the greatest skill of the clinician but an obedience in the patient which was seldom met with.

INTESTINAL AMŒBÆ.

So far as I can ascertain it was chiefly the work of Kartulis in Alexandria which first definitely incriminated intestinal amœbæ as pathogenic organisms, partly in consequence of his admirable and long-continued clinical studies, partly by his discovery of amœbæ in the sterile pus of hepatic abscess, and partly by his experiments on kittens. This work was commenced about 1880 and was already progressing when Koch visited Alexandria in 1883. The previous studies of Lewis and Cunningham had led these workers to think that these organisms were merely pseudoparasites in men, though they (or rather the latter) thought they were true parasites in cattle; and Celli and Fiocca and other workers seemed inclined to support them. As the result of my own studies in Bangalore, both on amœbæ and on the intestinal flagellates which abounded there, I felt almost convinced that all these organisms are, or at least may be, injurious to the host—and still think so. It appears to me to be a very rash statement to make that any parasite is quite innocuous. One might as well say that a grain of dust in a watch is harmless, because it does not always stop the mechanism. Certainly amœbæ may remain comparatively innocuous for considerable periods, let us say in the pockets of small and few ulcers in the intestines, or even in its lumen, but we never know whether they cannot at any moment produce serious lesions or relapses of old lesions, or may aggravate the lesions caused by other organisms. And it still seems to me to be a safe teaching that we should consider all intestinal amœbæ and flagellates to be potentially dangerous. However this may be, the rôle of certain amœbæ in dysentery has now been almost generally accepted.

Captain (now Colonel) Patrick Hehir, C.B., I.M.S., and myself certainly recognised both amœbæ and flagellates in India in cases of dysentery and diarrhœa as early as 1896—see, for example, my paper in the *Indian Medical Service Gazette* for May, 1897; so that Sir Leonard Rogers is scarcely justified in claiming that he first discovered amœbic dysentery in India in 1901 (p. 17 of his book), but Sir Leonard Rogers can well afford to lose this small distinction in comparison with the immense distinction which he has deservedly obtained for his elaboration of the treatment of dysentery by emetine.

EMETINE.

Emetine was first separated from ipecacuanha by Pelletier and Magendie in 1817 and was, I believe, first recommended for dysentery by Bardsley of Manchester in 1829, while Tull Walsh gave it by the mouth in 1891. But it was the elaborate studies of Rogers which first established the use of it (the hydrochloride) in 1912 and later, so that it has now been before the profession for more than three years. I believe that it is accepted everywhere, not perhaps as being essentially superior to ipecacuanha powder, but because the hypodermic injection of it is much less troublesome to the patient. Personally, I think that the hypodermic use brings the drug more directly into conflict with the amœbæ at the bottom of the ulcers, while ipecacuanha does more to attack amœbæ on the surface of the mucous membrane and in the lumen of the intestines, so that I am inclined to favour the use of both at the proper stages in the treatment. But as an immediately applicable routine treatment the hypodermic injection of emetine hydrochloride has certainly become a great boon to humanity, for which we owe a debt to Sir Leonard Rogers which cannot ever be repaid.

I must, however, again mention the use of the sulphates of magnesium and sodium, apparently originated for dysentery by the French physicians in the middle of last century and which use has now become almost universal in bacillary dysentery, so that many think that we have specifics against

both forms of the disease. According to many, ipecacuanha and emetine are powerless against bacillary dysentery, while the saline purgatives are powerless against amœbic dysentery.

DYSENTERY IN THE FORCES IN THE MEDITERRANEAN.

I now come to the almost unique experience which we have recently had in connexion with cases of dysentery among soldiers. As was to be expected, both forms of dysentery have occurred largely among the troops near the Mediterranean and the Red Sea. Apparently bacillary dysentery prevailed up to midsummer; but after that there was certainly an epidemic of amœbic dysentery in July and August. I was then on duty in Alexandria as consulting physician for tropical diseases, and had most unusual opportunities for studying the practice of the physicians in all the hospitals. On Oct. 17th we held a meeting at Alexandria, the Principal Director of the Medical Services being in the chair, to discuss the treatment of acute dysentery, and no less than 16 papers were read on that occasion. Subsequently we held another meeting on the pathology of dysentery, which the able pathologists of the hospitals had been carefully considering, and I think that altogether we could claim to know something about the subject, at least as regards the forms of dysentery and diarrhœa, pure and simple, or complicating the typhoids which had been occurring up till then. And I should now like to compare notes with officers who have all this time been practising in England on such of the cases as were invalided home.

Certainly up to June amœbæ had not been easily found in Egypt, but towards the end of July they began to be recovered without difficulty in a large number of cases, and this state of things continued till the end of September or later. After this, however, whether due to the large use of emetine in early cases or to the natural decay of the epidemic, amœbæ began to become more scarce, and I gathered from men who have worked long in Egypt that amœbic dysentery is likely to be supplanted by bacillary dysentery in the winter. This, of course, is the almost general rule; for amœbic dysentery is especially a disease of hot climates, and one which tends to be always prevalent more in the summer than in the cool season, and more in low latitudes than in high ones. Unfortunately, however, amœbic dysentery tends to be such a chronic complaint that the treatment of it continues to interest us long after the commencement of epidemics, and we have to guard not only against the chronic form of it but against the terrible hepatic abscesses which so frequently follow it.

TREATMENT OF AMŒBIC DYSENTERY.

As soon as we recognised the presence of amœbic dysentery among the troops emetine began to be employed by, I believe, every officer in charge of wards on the medical side; and, indeed, the Principal Director issued urgent orders to use it in every case of suspicious dysentery without waiting for a definite diagnosis as to the exact nature of the case. In my opinion this order was absolutely demanded and proved to be very beneficial.

All those who have had experience of dysentery will, I think, agree with the first sentence which I have already quoted from that old writer, George Wateson, to the effect that the sooner that treatment is commenced in dysentery the more it is likely to prevail. Once the amœbæ have begun their destructive trenching and mining under the mucosa there is apparently in many cases no natural limit to their activities, and they will soon end—as we unfortunately saw in necropsy after necropsy—by removing up to 90 per cent. or more of the surface. Every hour, therefore, counts at the beginning of the infection, and the delay of a few weeks often means almost irreparable ruin to the colon, even if the patient survives. It appears to me to be useless to wait for laborious laboratory examinations as to the exact nature of the infection. Emetine is so benign a drug when given subcutaneously that it may well be administered on the chance that the infection is amœbic, just as it is the universal practice in the tropics to give quinine in nearly all tropical fevers without waiting for a pathological diagnosis—at least, if this is likely to be delayed for more than a few hours. As in fever, so in dysentery we strike our preliminary blow on the chance that it will destroy an enemy whose presence we have reason only to suspect. The results were remarkable. Of course, owing to many difficulties the order referred to could not take full effect under several weeks, but after that I was informed by everyone that the newer cases were not of so grave a type as the earlier ones.

I will now digress for a moment to emphasise a point which appears to me to be of great importance. The large bulk of the troops came from Britain, Australia, and New Zealand, and were therefore men who had never had amœbic dysentery before. Many of the cases were at first exceedingly grave—as grave, in fact, as I have ever seen among European troops freshly arrived in India. Many of them had died before reaching the base hospitals, and those that survived had frequently reached the condition of "running dysentery," which always suggests to me that a large proportion of the mucosa is already destroyed. But, on the other hand, it was remarkable that among the Indian troops, who are exposed to amœbic dysentery from childhood, there was not nearly the same frequency of severe cases. I was, in fact, informed at the Indian Hospital that they did not suffer much from the disease, and that the cases which occurred were comparatively slight. From this and other considerations I am therefore led to believe that in amoebic dysentery, as in malaria and many other diseases, there is likely to be a certain amount of immunity acquired during childhood in localities where such dysentery is endemic, and that, conversely, there is no such acquired immunity among the inhabitants of non-endemic areas. I think, then, that among the European and Australian troops we had to deal with acute amoebic dysentery in its most unmodified and malignant form. This point must be remembered in connexion with the results of emetine treatment. The studies of Rogers and of many Indian physicians were carried out mostly upon Indian patients—which probably explains the very rapid action of the drug; and we could hardly expect that we should have equally rapid results among the European troops in the Mediterranean.

METHOD OF TREATMENT WITH EMETINE.

Nevertheless, we were all convinced of its great, and indeed remarkable, efficacy. As a general rule, doses of 1 grain of the hydrochloride a day were prescribed, either given in one subcutaneous injection or given in two doses morning and evening. Practice differed considerably as to the number of doses administered. In one hospital the rule was

that of three days on and three days off, and in another hospital the rule was five days on and five days off; while many practitioners preferred to give it daily, even for some weeks, without intermission. Indeed, the practice in India has frequently been to administer it, not only for weeks, but for many months; and I have heard of cases who have altogether had a hundred doses or more. But opinion began soon to be divided upon this point in rather an abrupt manner. In one hospital three cases of dysentery died without our being able to find any very obvious cause of death, and some suspicion was aroused that the death may have been due to heart failure owing to cumulative action of the emetine.

These cases were admirably reported by the medical officers in charge, but on considering them carefully I doubted much whether the fatal result could in any way be attributed to the drug. Two of the cases died, indeed, about a week after the last dose of emetine, and both these cases had mysterious rises of temperature for some days before death, these suggesting that death was really caused by some secondary infection which could not be traced clearly at the necropsy. The third case died four days after the last dose of emetine, though he was convalescent and had been allowed out of bed. Even in this instance the case against emetine was extremely weak, because the total amount of emetine which the patient had received from the beginning scarcely amounted to what Rogers calculated is a single lethal dose—namely, about 15 grains for a man. There was fatty degeneration of the heart in all these cases, but no more than is frequently found after any grave illness.

On the other hand, numerous patients had received emetine for more than 30 days without exhibiting any bad effects which could at all be traced to the drug; and Indian officers especially were not inclined to admit that emetine is at all cumulative or mischievous in its results. Nevertheless, practice gradually crystallised into the formula that, unless there was very strong reason for continuing emetine, it should be remitted, at least for a time after about ten days, especially if it had ceased to do good. And, on the whole, I think that this is the best practice in acute dysentery.[1]

COMPLEX INFECTIONS.

As was to be expected, about 10 or 20 per cent. of the cases failed to be cured by emetine. I do not mean that all of these patients died, but that the dysentery gradually merged into the chronic form. Most, but not all, of these cases were patients who had not received emetine early in the infection, and in whom therefore the mucosa was probably destroyed over a large surface before the treatment was commenced. And this introduces a very important factor in treatment.

Emetine can only destroy the parasites in the ulcers, it cannot heal the lesions themselves. Now it is almost or quite certain that in most cases the original trench-work of the amœbæ is followed by an extensive bacillary invasion of some kind. At our pathological meeting in Alexandria, difference of opinion was expressed as to whether these secondary organisms were always *Bacillus dysenteriæ* of any strain, or others, including the normal flora of the intestine; and prolonged researches will be required before this point is settled. We must, of course, understand (though I have not stated it clearly up to now) that complex infections were exceedingly common. For obvious reasons it is quite impossible for me to give figures, but I gathered from continual visits to the hospitals that this was the case. Thus, both the amœbic and the bacillary forms of dysentery occurred together in a certain proportion of cases, and in others both forms complicated the typhoids, or were complicated by obstinate diarrhœas—many of the latter being probably due to the flagellates.

Now in all such cases we could hardly expect emetine to do more than its own proper work; it destroyed the amœbæ, but the patient was then obliged to deal with the secondary or complicating maladies. The text-book picture of simple amœbic dysentery was therefore not the only one seen. It frequently happened that cases which were brought in for the typhoids showed dysentery in convalescence, and even died from it. We were at first inclined to attribute these cases to hospital infections, but later came to the conclusion that the dysentery infection had probably been present from the beginning.

I became very convinced of this from the remarkable results of Lieutenant G. B. Bartlett, R.A.M.C. (T.), pathologist to one of the hospitals. He found dysenteric lesions in 33 necropsies, and has kindly given me a preliminary classification of these, pending further studies which he will, I hope, publish in detail. Out of the 33 cases 15 died from exhaustion, 2 from typical tropical abscess of the liver, 2 from perforation of the dysenteric ulcers, 2 from hæmorrhage, 2 from typhoid or paratyphoid, and no fewer than 10 from other causes such as wounds, empyema, septicæmia, cirrhosis of the liver, &c. Now it is remarkable that in many of these cases dysentery had not been diagnosed at all during life, although post mortem the dysenteric lesions were found sometimes to be extensive and severe. Out of these 33 cases, moreover, 16 were found to be purely amœbic, 3 were amœbic with typhoid ulceration, and in 14 there was evidence in the intestine (or rarely in lymph glands, spleen, liver, or kidneys), of a secondary infection on the top of the amœbic ulceration.

We are thus forced to infer that the amœbic ulceration may not always declare itself during life in the form of a typical dysentery which can be diagnosed by the well-known signs. In fact, I personally think that much mischief may be caused by the amœbæ without any signs whatever, and that in many cases the typical disease does not begin to show itself until some secondary intestinal invasion has taken place on the top of the trench-work of the amœbæ. How long this larval form of amœbic dysentery can continue I cannot say; but in many cases it had continued through the whole course of an intercurrent typhoid infection. Indeed, I was much inclined to recommend, on the strength of Dr. Bartlett's figures and of other observations, that emetine should be given to all hospital patients as a preventive, just as we give quinine to almost

[1] Since this was written an important preliminary note has been published in the *British Medical Journal* of Dec. 18th by Dr H. H. Dale, F.R.S., stating that experiments on cats and rabbits showed that hypodermic injections of emetine (? hydrochloride), continued from three to ten days in doses above those usually administered in cases of dysentery, caused diarrhœa, emaciation, and other symptoms with fatal results. Dr. Dale thinks that these experiments suggest that "emetine can produce cumulative poisoning of serious importance." I presume that he means rather that the effect is cumulative than that the drug itself is cumulative—another thing. If one dose can cause intestinal hyperæmia, I presume that too many and too large doses can exaggerate this effect without the drug itself being actually cumulative. We await further experiments, but the few already made fully justify the note of caution sounded by those to whom I have just referred.

all hospital patients in a very malarious locality. But the recommendation was hardly necessary, since most officers in charge of wards early became very much alive to this danger, and were giving the emetine very generally in consequence.

While I was in Alexandria pure bacillary dysentery was not very common, though we saw a fair number of cases. There were also, of course, a proportion of cases which did not certainly belong to either group; and we had the usual difficulties in the way of diagnosis. The pathologists scarcely had time at first to make very minute studies, and everyone knows that amœbæ may be easily overlooked unless plenty of time is given to the search. I will not say more under this head, as a central laboratory has now been established and will deal much more thoroughly with such questions in the future.

Returning then to treatment, our cases practically divided themselves into two groups—those in which about one week's emetine treatment practically resolved the dysentery, and those in which it failed to do so. Of course, the latter cases were by far the more troublesome, and they generally resulted in what I have always known as running or even incontinent dysentery. I fear that some of our best clinicians admitted their failure in dealing with these, which, however, form only a small percentage of the cases. Post mortem they always showed most extensive lesions, and, indeed, an almost entire destruction of the mucosa. Many of the cases died, but, as I have already said, others resulted in chronic dysentery and were invalided, and are now probably under treatment in this country.

PURGATIVE ACTION OF SULPHATES.

Now, regarding the sulphates of sodium and magnesium, these have long been recognised as invaluable for the treatment of bacillary dysentery. Their purgative action is not due to peristalsis, but to the increase of the secretion of fluid and at the same time to the retardation of its absorption. According to the researches of Hay the dose produces increased secretion of fluid as it passes downwards, and the salts do not purge when given intravenously. But the more recent experiments of Cook and Schlesinger suggest that the drugs are first absorbed from the stomach and then cause a rush of fluid from the mucosa of the large intestine; and these results certainly accord more with the fact, often seen, that the salts purge within half an hour after administration. It was also shown that bismuth meals administered at the same time as the sulphates succeeded in travelling downwards a very little distance before the fluid began to collect in the large intestine, which proves the same thing.

These points are of great importance in connexion with the treatment in dysentery. I infer that the salts act in this disease simply by flushing out the large intestine and washing away the parasites, amœbic or bacillary, by a strong current *from within*—that is, from the blood itself. In fact, they probably produce the same, or better, effects than would be produced by energetic washing of the surface from without. That is to say, as long as these salts continue to be given the dysenteric-producing organism cannot easily get a footing within the mucosa. Of course, this reasoning is hypothetical; but, taken in connexion with the proved efficacy of the drug, it encourages us to use them in both forms of dysentery. Indeed, the practice of administering the sulphates together with emetine in the earliest days of a dysentery is now becoming almost universal; the emetine kills any amœbæ that may be present, and the salts wash them and injurious bacteria out of the follicles. In further advanced cases—say those of several weeks' duration—the use of the salts becomes more problematical in the case of amœbic dysentery, and one must be on guard against exhausting patients who have been extremely purged by the disease itself, especially if this has already taken the form of running dysentery. On the other hand, I admit that many practitioners gave the salts in almost all cases of whatever duration.

MEDICINAL TREATMENT.

The treatment of running acute dysentery is the great problem in most cases, and, I regret to say, one which cannot always be solved, as admitted by some of the most experienced practitioners in all countries. Here the mischief has been already accomplished, and we are probably in the presence of an almost denuded colon. We tried anti-dysenteric sera in many such cases on the mere chance that they might destroy the specific bacteria if present, there being generally not sufficient time to make minute pathological studies. And the treatment was said by many to be remarkably beneficial in a certain proportion of cases. But others were not so favourably inclined to it, and others again argued that an ordinary horse serum would probably have been just as useful. I have suggested that polyvalent sera might be put on the market against other intestinal flora than the specific ones, and hope that such will be tried before long.

Failing sera, we had recourse to medicinal treatments. I always urged the bismuth treatment elaborated by Deeks in Panama and consisting of a heaped teaspoonful of the subnitrate three or four times a day. The utility of this medication is supposed to depend not only upon the astringent value of bismuth, but also upon a chemical change, and lastly upon the mechanical action of the powder, which is likely to injure amœbæ by attrition. At all events, bismuth in these and smaller doses is very generally given in dysentery, was largely employed throughout the hospitals in Alexandria, and certainly, I think, proved distinctly useful. It was generally administered continuously, beginning a day or two after the initial treatment with emetine was commenced.

I have always liked tannic acid in conjunction, say up to 10 grains for each dose. In fact, tannic acid has been used for a long time, and was often administered together with ipecacuanha powder, because it tends to check the vomiting induced by the latter, as well as because of its astringent effect. But it is a good general rule not to use any astringents at all too early—that is, until the specific remedies have had time to take effect. After that happens, however, opium, bismuth, tannic acid, catechu, and other astringents do often succeed in terminating the attack very rapidly. I regret to say, however, that many cases became cases of established running dysentery in spite of all treatment.

Collapse is another very difficult condition to deal with. Lieutenant-Colonel A. H. Lister, of one of the hospitals in Alexandria, often used the subcutaneous infusion of hypertonic salines together

with 10 minims of adrenalin solution, 1 in 1,000 every four hours, injected hypodermically, with very good results, and strongly recommends the adrenalin.

Opium is, of course, an invaluable drug throughout the treatment, and, though some practitioners appear to be nervous about it, I think that the use of it is really general at all stages.

ENEMATA.—APPENDICOSTOMY.

We now come to a very vexed question—namely, the use of enemata in acute dysentery. There is no question of their use in chronic dysentery, especially of low-down ulceration; but some of us felt that they are contra-indicated in very early cases. The disease is itself complicated with purging, and if the sulphates are being given at the same time, there is a continual washing out of the bowel from within. In such cases I really cannot understand the rationale of using massive lavations, which depress the patient and may even rupture the very thin walls of the ulcers; and we never know how old and thin the ulcers may be. Others object to them on the ground that they may engender secondary infections from without; and I have a feeling that the use of enemata is somewhat too frequently followed by running dysentery. Others again adopt enemata as a standard treatment.

Such a great authority as Professor Kartulis is confident that tannic acid is most beneficial from the first. Rogers often recommends quinine lavations. Colonel Lister was an advocate of three or four ounces of warm olive oil containing a drachm of ichthyol, preceded by a morphia suppository half an hour before the injection. Nitrate of silver has always been employed in chronic dysentery, and I know many cases where it has certainly effected a cure; but nowadays we should use protargol or similar salts—and these were employed with fairly good results in many of our fresh cases. If lavations are employed at all, I like warm water without salts, as it swells up and destroys the amœbæ; or warm and weak permanganate solution, or warm and weak solution of quinine. But I still do not favour this form of medication very much in acute dysentery.

I was able to follow up only one case of acute dysentery in which appendicostomy was tried, and cannot say that the result was very brilliant. There does not appear to me to be much *a priori* argument in favour of it. The bowel can be washed out from within by means of the sulphates, and I am by no means convinced that external washing gives as much benefit in the case of the large intestine as it would do in the case of a superficial ulceration of the skin, while the operation itself and the wound made by it add a severe trial to patients who are already sorely tried by their malady. At our discussion on dysentery Colonel Tubby expressed himself as opposed to appendicostomy for acute dysentery and even for chronic amœbic dysentery, but was less opposed to it for bacillary dysentery. Irrigation with oil through the appendix appears to me to be more promising than that with other fluids, and it was tried, but with doubtful results, in the case which I watched.

SUBSIDIARY ITEMS OF TREATMENT.

Regarding subsidiary items of treatment, I need scarcely insist upon the general use of cholera belts or warm applications to the abdomen. In India I frequently used very hot hip baths, which I am certain give great relief, often lasting for several hours; and these baths can be repeated several times a day if the patient is not in too weak a condition. We could not try such baths much in Alexandria, but I would suggest them for use in the cases in this country. Personally also I have always been much in favour of oils by the mouth. Olive oil is an old remedy for dysentery in Italy. A dessertspoonful of it with a pinch of salt may be given several times a day; but the patient soon sickens of it, and then I suggest the non-purgative medicinal paraffins—which, indeed, may be given from the first. I have often used these, and have observed that they appear in a saponified form in the stools—a form which is likely to be very injurious to all kinds of organisms, and, in fact, to smother them. Indeed, this effect of oils is, I believe, well recognised.

Innumerable drugs have been supposed to be curative of dysentery. Kartulis told me that he had had very good results from a drug called Uzara (difficult to obtain in this country), and Dr. Fingland recommended in THE LANCET of August 15th, 1903 (p. 456), the use of *Aplopappus baylahuen* (Parke, Davis, and Co.) on the results obtained from three cases only. The evidence on all such drugs is generally very weak, and they are scarcely to be tried unless all other measures have failed. In this paper I have confined myself to the broader lines of treatment used by the majority of clinicians.

DIET.

Regarding diet in acute dysentery, I must say that after comparing the very various diets given by many medical men I am beginning to be almost sceptical as to whether any particular form presents any real advantage. I have seen cases both improve and die with liquid diet, bland diets, and ordinary diets; and, in fact, cases which are not given the great advantages of perfected hospital dietaries are often those which suffer the least.

We are too apt to think that the form in which food is presented to the stomach is also the form in which it appears in the colon. For example, bread is a solid diet for the stomach, but almost a liquid one for the colon; and the converse holds very often with milk. To be frank, I scarcely dare speak upon this subject owing to the strong but very opposite opinions held by medical men. On one thing, however, I am pretty convinced—namely, that large bulks of fluid diet are injurious in very running dysenteries. It seems to me that such bulks of fluid are rapidly absorbed from the stomach and increase the blood pressure, with the result that fluid rushes out again from the ulcerated surfaces of the intestine. Whatever the explanation may be, we can observe that such large bulks of fluid are followed sometimes within ten minutes by copious evacuations which by no means benefit the patients. The case is much the same as that of large bulks of fluid in the treatment of catarrhs; and personally I prefer a comparatively dry but varied dietary in running dysenteries.

Perhaps many medical men would be almost appalled by this hypothesis, and would never dream of presenting the patient with anything but whey, milk, broth, and so on. Certainly in typhoid a premature return to solid diet notoriously sends up the temperature; but the large intestine is farther away from the stomach, and I have not seen much evidence of a similar effect in dysentery. At the same time, one officer told me that when he wished to diagnose the presence of dysenteric ulceration in a convalescent case of enteric he gave a meal of oatmeal porridge.

HEPATIC ABSCESS.

I now come to the most important point of all—the prevention of hepatic abscess. And this especially is the leading proposition before us here in England. Some months ago we in Alexandria heard from several sources that you in England had discovered only bacillary dysentery; and still, by many accounts amœbæ are not frequently found here. This divergence of experiences can be explained in several ways, either on the hypothesis that the amœbæ have become scarce during the lapse of time, or that they have been destroyed in the majority of the cases by emetine, or that the epidemic of amœbic dysentery lasted only for a very short time. Possibly also amœbæ were not found because they were not searched for frequently enough in each case. By no means always do we discover the amœbæ in the first sample. I remember an acute case in which I discovered them only on the fourth trial, though the previous trials had been very carefully conducted; and it stands to reason that we cannot give negative diagnoses on the strength of such extremely small samples as we usually examine. On the whole, I think that in view of Lieutenant Bartlett's post-mortem figures there was a vast amount of amœbic dysentery in the Mediterranean, even among persons in whom the disease was never diagnosed,

Now we must remember that hepatic abscess follows in a large proportion of amœbic infections, whether these infections have produced dysenteric symptoms or not. On taking the histories of cases of hepatic abscess, we find no history of previous dysentery in something like a quarter of the cases—the probable truth being that the amœbic infection of the liver takes place from small intestinal pockets in which amœbæ had remained without causing widespread dysenteric lesions. In fact, I have often thought that abscess follows the milder cases of dysentery more frequently than the severe ones. Again, from some figures quoted by Rogers in the *Indian Medical Gazette* for November, 1912, we learn that the British army in India during the decade 1901–10 had one case of liver abscess for every seven cases of dysentery, more than 14 per cent. If a similar proportion will be found to hold for Mediterranean dysentery, we can expect a very large number of cases of abscess.

Prophylactic Treatment.

We must remember that the abscesses do not appear only a few months after attacks of dysentery, but continue to appear for years afterwards. Now this seems to me a very grave danger, and I would strongly urge that the only way to avoid it is to give courses of emetine or ipecacuanha in convalescent cases every month or so. I would suggest emetine in grain doses for three days every month until the patient is finally returned to duty, and think that this should be administered whether any symptoms of dysentery remain or not. As long as any amœbæ still live in the intestine, so long will the danger of abscess be present, or at least that is the safest hypothesis to live with. And I do not care whether a positive diagnosis of amœbic dysentery has ever been made or not made. If I myself had been attacked with dysentery I would certainly submit myself to this discipline without fail. Acute dysentery is a grievous malady, but it is only the first act of the tragedy. Chronic dysentery is the second act, and is still worse; but hepatic abscess is the third act, and is worst of all. We are too apt to look upon amœbic dysentery as being only a temporary affair easily cured by a few doses of the specific.

Some clinicians (such as Colonel Robinson in Alexandria) think that ipecacuanha is still useful in the later stages of dysentery, and especially as a prophylactic, and I am inclined to agree with them. Emetine destroys the parasites in the mucosa, but I doubt whether it can really have the same effect upon those which are living and perhaps abounding in the lumen. For these perhaps the powder is still useful, and, I think, can be administered in much smaller doses after emetine has been given than would be useful without emetine. For example, 5 grains each of ipecacuanha powder, Dover's powder, tannic acid, and sulphate of quinine can be administered the last thing at night on an empty stomach, without prefatory opium, and if given properly will not cause vomiting, at least after the first dose or two. But this is a matter of personal opinion, and I think that as long as ipecacuanha is given in some form, the same result will be achieved. Of course, if abscess is beginning to manifest itself in any way, return to full doses of emetine should be enjoined, combined, of course, with suitable diet. Most people urge the entire absence of alcohol, but three of the worst cases of abscess ever seen by me in India occurred in teetotalers, and abscess is fairly frequent among Indians who never touch alcohol.

CONCLUSION.

I have now kept you long enough, although I have practically dealt only, and that cursorily, with the treatment of acute dysentery. Fortunately, I think, we are not yet in the presence of much of the chronic dysentery which will probably remain over from the epidemic. The treatment of chronic dysentery is itself a very large subject requiring special consideration, and we can hardly deal with it now.

Two points must be mentioned before I close. The first is, that we thought of a method of diagnosing dysenteric ulceration by means of the X rays, and this method was ably worked out by Lieutenant Glasson, of one of the Alexandrian hospitals, whose paper will shortly appear in the Proceedings of this society. Secondly, I should like to call attention to the excellent "Notes on the Treatment of Diarrhœa and Dysentery,"[2] recently written by Lieutenant-Colonel Andrew Balfour, C.M.G., which will be useful to all concerned.

In conclusion, I hope that we may now hear their views on the treatment of dysentery from some of the many medical officers who are now treating cases in England.

[2] John Bale, Sons, and Danielsson.

BRIGHTON AND TUBERCULOUS PATIENTS.—Since the taking over of the Brighton Poor-law institution by the medical authorities certain Poor-law tuberculous patients have been under treatment at the borough sanatorium, the agreed charge for which was 21*s.* per week. The Local Government Board meanwhile have intimated that they consider it desirable that the schemes for the institutional treatment of tuberculosis should make provision for all classes of the community, and if the corporation decided to treat tuberculous persons who are chargeable to the parish on the same terms as other non-insured persons, the corporation would receive a grant of one-half the cost and the rates would, to that extent, be relieved. The guardians agreed to this arrangement and the corporation health committee recommended that it be adopted, effecting as it would, as between the corporation and the guardians, a net saving of £500 per annum. The corporation at its meeting on Dec. 16th last ratified the scheme.

PENETRATIVE WOUNDS OF THE ABDOMEN.

A LIST OF THE FIRST FIFTY CONSECUTIVE CASES OPERATED UPON AT THE 17TH CASUALTY CLEARING STATION IN THE FIELD, FLANDERS.

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With a Note by

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IT has been suggested to us that it might be of interest to publish results obtained by laparotomy for penetrative wounds of the abdomen and to quote actual cases. We have, therefore, arranged in a tabular form certain facts about the first 50 cases operated upon. We also add the number of cases during this same period (three months) which have not been operated upon, either because they were mortally wounded and moribund, or because no perforation of the gut was suspected, or because they were expected to recover without operation. No analysis has been attempted in this paper, as it is hoped that with larger experience more accurate conclusions will be able to be drawn and published at a later date. We have merely stated our procedure in operation and have attempted to emphasise some facts which we have found to be important in dealing with these cases.

Time between injury and operation.—The cases have come to us wonderfully quickly from the firing line. We have found that, generally speaking, the earlier a case is operated upon the better the chances of recovery. The best results have been obtained where patients have been treated within 12 hours of being wounded.

Preliminary procedure to operation.—After admission the men are first of all rapidly and gently undressed and warmed up. Rectal salines are not given where there is a risk of damage to the lower colon. Morphia 1/4 gr. and atropine 1/100 gr. are administered subcutaneously as a routine before the anæsthetic, unless there be some contra-indication, such as previous administration. Laparotomy is generally performed about one hour after admission.

Examination of the patient.—A careful history is taken, especially with a view to discovering the course of the missile through the abdominal cavity. It is generally possible to gain most valuable information as to the course of the missile by questioning the patient as to his own position when he was struck, his posture, his position in regard to the enemy, as to whether the missile came from above, from below, from the side, and so on.

The man's general aspect is a very useful guide to the seriousness of his injury, the characteristic ashen grey colour of the face being of great importance. Perhaps of all signs the condition of the pulse at the wrist is the most reliable index, both of the man's condition and of the seriousness of the intra-abdominal condition. 1. Where it is absent altogether it is, generally speaking, almost hopeless to operate, not only because of the man's general condition, but because the seriousness of the lesions will almost certainly require lengthy operation. 2. Where it is thready, running, and uncountable the prognosis is perhaps very grave but not hopeless, as our results have shown, for extensive lesions requiring resection have in several instances been successfully treated. 3. Where the pulse is stronger the prognosis, generally speaking, seems to improve according to the quality of the pulse.

The usual symptoms and signs of intraperitoneal lesion, such as pain, tenderness, rigidity, and vomiting, are generally markedly prominent. Even morphia does not, as a rule, completely disguise these, and in some cases no amount of morphia short of poisoning the patient appeared capable of overcoming pain. Entire absence of rigidity where a perforation of the gut has certainly been present has been observed in moribund cases only.

Where clinical signs and symptoms point to a perforation of the gut, even if, under anæsthesia, examination reveals no penetration of the peritoneum, we think it advisable to do a laparotomy; as we have lost at least one case where the peritoneum was found to be intact and the track of the bullet was entirely extraperitoneal, and yet the bowel had been perforated. This case would probably have been saved had we known that a bullet could cause a perforation of the gut without penetrating the peritoneum.

The Operation.

1. *Anæsthesia.*—For purposes of anæsthesia, chloroform induction followed by open ether has been invariably employed. Subcutaneous saline under both breasts has been given as a routine, whenever the pulse has not been really good. From 1½ to 2 pints are generally administered from a Lane's indiarubber bag.

2. *Incision.*—The incision is planned to give most ready access to the area in which the lesions are calculated to be in. We have most frequently adopted that through the rectus muscle, increasing the distance from the mid-line according to the situation of the lesion. The incision has rarely been more than 4 to 5 inches in length.

3. *Examination of peritoneal content and organs.*—On opening the peritoneal cavity excessive blood and intestinal content are rapidly mopped away by gauze from a long roll. The organs are then systematically examined, beginning with that suspected of being most damaged. Any source of hæmorrhage or urgent lesion is dealt with immediately, otherwise we have adopted the principle of finding all the lesions before proceeding to their treatment. By so doing precious time is saved, which may have been wasted in dealing with numbers of minor lesions, when one large resection may have treated all the wounds rapidly, more surely, and with better prospects for recovery of the patient. When perforations of the gut are met with they are at once covered by fourfold gauze, and a light clamp is applied to prevent extravasation of content. The examination of the rest of the abdominal organs is then proceeded with.

4. *Treatment of lesions.*—Small perforations or rents of the intestine are invariably sutured in the usual way, preferably in the transverse axis of the gut, or one is sutured thus and one longitudinally where there are two close together. Resection is done (*a*) when there are rents involving

more than one-third of the circumference of the gut; (*b*) when multiple rents or perforations lie very closely together, endangering the vitality of the operation area; (*c*) when the mesenteric edge of the bowel and the mesentery are both damaged; (*d*) when the mesentery has been badly torn; and (*e*) when the lesions are very numerous (to save time). It may here be said that it takes a shorter time to do a circular resection than to suture six or eight separate rents, and in our experience the shock and paresis following small resections are not greater than those accompanying multiple sutures. Where larger resections are done—i.e., over 10 to 12 inches—we have generally favoured lateral rather than circular anastomosis. For all suturing of the gut we have used fine linen thread. Bleeding wounds of the liver and spleen, where not too extensive, have generally been packed with gauze, removed on the third or fourth day. In one extensive laceration of the liver two pieces had to be resected and the rents in the liver sutured with iodised catgut.

5. *Treatment of peritoneal cavity.*—After dealing with the various lesions, or best of all while the small gut is outside the abdomen, the peritoneal cavity is rapidly but carefully mopped as clean as possible; and where collapse is marked warm saline may be introduced into the peritoneal cavity with great benefit. Wherever the gut has been perforated it is our belief that drainage of the peritoneal cavity for 24 to 48 hours is of undoubted value, not merely because a certain amount of infected fluid drains away, but because where we have not drained the discomfort of the patient after operation has been much more marked than where we have drained.

6. *Treatment of the abdominal wall.*—We have always first sutured the peritoneum and posterior sheath of the rectus with linen unless speed was urgently demanded, when silkworm gut through and through all layers was used. The rest of the strata have then been stitched one by one, removing the local tension by two or three silkworm gut sutures through all layers except the peritoneum. We have found it advisable to strap our sterile dressings to the abdomen by means of plaster to avoid exposure of wounds subsequently.

After-treatment.

The usual post-abdominal régime has been practised, such as warmth, Fowler position, &c. Rectal salines four-hourly are almost invariably given for 24–48 hours. On the second or third day ½ c.c. of pituitrin is administered subcutaneously and 2 ounces of glycerine per rectum, repeated the following day if necessary. In our experience the action of pituitrin is of inestimable value in promoting intestinal peristalsis. About the fifth day an enema is generally given, except where the pelvic colon has been sutured. Aperients are allowed on the eighth or ninth day, unless the bowels have moved freely of their own accord before, which has happened not infrequently. Fluids, such as water, tea and sugar, and beef tea are given for the first three days, water being allowed in sips when asked for immediately after operation. Milk is added on the third day, milk puddings after the fifth day as a rule, and chicken after the seventh day.

Regurgitant vomiting is treated by stomach lavage, repeated as often as necessary. Persistent hiccough following larger resections has in our experience been relieved only by morphia or stomach lavage.

Evacuation to the base.—Patients have not generally been sent down to the base until out of danger—i.e., when temperature and pulse had settled and were good, when the bowels had moved, when the tongue was clean and moist, and the patients were hungry.

Results.

Out of this series of 50 cases 17 deaths have occurred and 33 cases have been evacuated to the base. We have heard from the majority of the cases since, as each man is requested to write to us in ten days' time and again in a month. We have heard of no subsequent deaths.

Causes of death.—From the sections we have been able to make certain that the cause of death in most cases of perforative abdominal lesions is primary hæmorrhage, combined with an element of shock always present in these cases. Next in importance appears to be general peritonitis, which, however, takes from about 48 hours onwards to bring about a fatal issue. A few cases seem to die from pure shock due to tissue damage inflicted by irregular-shaped missiles without any degree of hæmorrhage (e.g., kidney and liver in one case); a few others from secondary hæmorrhage into the bowel.

Cases not Operated upon.

The following cases were not operated upon during this period, because patients were moribund, because no perforation was suspected, or because conservative treatment was considered advisable:—Total number, 41; died, 17; evacuated to base, 24.

It is of interest that of the cases deliberately treated conservatively not a single case died, though the bullet had traversed the peritoneal cavity quite obviously in a number of these. The indications for conservative treatment were always the general appearance of the patient, absence of shock, the condition of the pulse, the state of the abdomen, and the course of the bullet.

In conclusion we beg to express our indebtedness to our commanding officers, Colonel Way and Lieutenant-Colonel J. W. Langstaff, for permission to publish these notes, as well as for the constant encouragement and help they have afforded us at all times in dealing with these cases. In particular we have to thank the consulting surgeon of our army, Surgeon-General Sir Anthony Bowlby, and during his absence Colonel Cuthbert Wallace, for their inestimable advice and their unfailing zeal in coming to our aid so frequently and so regularly.

NOTE BY SURGEON-GENERAL SIR ANTHONY BOWLBY.

The hospital in which the operations described above have been done is one of the Casualty Clearing Stations, and is in tents pitched beyond ordinary shell fire. The arrangements for sterilisation are much the same as in a civilian hospital, and the theatre is lighted by acetylene gas. Many of the operations have been done in the middle of the night.

We have all learned a good deal since the war began, but there is much yet to learn. In the earlier days we were still under the influence of the South African War, and most surgeons believed that bullet wounds of the abdomen did best if left alone. That was also the opinion of many surgeons who had been in the Balkan War. As time went on we had occasion to change our minds, for we heard from the surgeons at the base

PENETRATIVE WOUNDS OF ABDOMEN: TABULAR STATEMENT OF 50 CONSECUTIVE OPERATION CASES.

No.	Age.	Wounds of entry and exit. Sector of abdomen, above or below umbilicus.	Missile.	Special signs or symptoms. Pulse.	1. Lesions found at operation. 2. Peritoneal content.	Treatment: 1. Incision. 2. Of lesion. 3. Drainage of peritoneal cavity.	Result and days in station.	After results: Intra-abdominal; respiratory; abdominal wall.	Necropsy; Whether done; operation area; lesions missed; other facts.
1	19	Entry: 1 in. below and to left of umbilicus. No exit, but bruise on left buttock from where bullet was extracted later. Narrow sector, below umbilicus.	Bullet.	Pulse 112, good.	1. Two perforations of jejunum 6 in. from duodenum. 2. About two ounces of small intestine content quite local, and some blood.	1. Left rectus. 2. Perforations sutured. 3. Pelvis drained.	Evacuated to base; 10 days.	Severe diarrhœa on fourth day; marked bronchitis; wound suppurated.	—
2	19	Entry: 12th rib right posterior axillary line. No exit. Wide sector, above umbilicus.	High-explosive shell.	Hæmatemesis. Pulse 136, thready.	1. Ragged tear in small curvature of stomach about 1½ in. long. Large hæmatoma in wall of hepatic flexure of colon; also wounds of both arms and legs. 2. Enormous amount of blood in peritoneum.	1. Right rectus. 2. Perforation in stomach sutured. 3. Under surface of liver drained.	Died 24 hours after operation suddenly.	Patient died after an enormous stool of fresh blood, evidently a secondary hæmorrhage from hepatic flexure.	No necropsy.
3	19	Entry: Left margin of rectus 2 in. above pubis. No exit. Narrow sector, below umbilicus	Bullet.	Abdomen rather distended and very rigid. Pulse 132, thready.	1. Single perforation of iliac colon, and a strangulated hernia of whole of movable small intestine into an enormous ileo-cæcal pouch. 2. Small escape of colon content.	1. Left rectus. 2. Perforation in iliac colon sutured. Retroperitoneal hernia reduced, sac ligatured, and mouth of sac closed with sutures. 3. Pelvis drained.	Died 12 hours after operation.	Patient died of shock, largely due to length of operation and difficulty in dealing with strangulated hernia.	No necropsy.
4	19	Entry: 1 in. below and to right of umbilicus. Exit: 3 in. below and 3 in. behind left anterior superior iliac spine. Narrow sector, below umbilicus.	,,	Pulse 120.	1. Two perforations in ileum about 4 ft. apart. 2. Much blood.	1. Left rectus. 2. Perforations sutured. 3. Pelvis drained.	Evacuated to base; 7 days.	—	—
5	19	Entry: At umbilicus. Exit: Just below 12th rib left posterior axillary line. Narrow sector, at umbilicus.	,,	Very blanched. Pulse 140, thready.	1. No bowel lesion found. Bullet had torn lower pole of left kidney in passing out of abdomen. 2. Enormous amount of blood.	1. Left rectus. 2. Two stitches into lower pole of kidney and peritoneum closed over it. 3. Lumbar wound opened up and drained.	Died in 12 hours. Shock and original hæmorrhage.	—	No peritonitis or bowel lesion found. No fresh hæmorrhage into abdomen.
6	19	Entry: 6th and 7th rib right posterior axillary line. Exit: 6th and 7th rib left mid-clavicular line. Wide sector, above umbilicus.	,,	No vomiting. Pulse 120.	1. Bullet had passed through liver and gastro-hepatic omentum, missing small curvature of stomach by ½ in. 2. Much blood.	1. Right rectus. 2. Wound on under surface of liver packed with gauze. 3. Gauze drain.	Evacuated to base; 6 days.	—	—
7	21	Entry: between 6th and 7th rib (right). 3 in. from mid-line. No exit. Narrow sector, above umbilicus.	Revolver bullet (accidental).	Hæmatemesis. Pulse 124.	1. Liver perforated, but neither wound bleeding. A ragged tear about 1½ in. long found in lesser curvature of stomach about 1½ in. from the pylorus. 2. Much escape of mucus and bile.	1 Right rectus. 2. Stomach tear sutured. 3. Under surface of liver drained.	Evacuated to base; 9 days.	—	—
8	20	Entry: Just below umbilicus. Exit: 2 in. external to right anterior superior iliac spine. Narrow sector, below umbilicus.	Bullet.	Pulse 96.	1. Bullet had not entered peritoneal cavity, but had caused a large extraperitoneal hæmatoma. Just beneath line of injury small hæmorrhage into omentum. 2. Nil.	1. Right rectus. 2. Nil. 3. Abdomen closed.	Evacuated to base; 5 days.	—	—
9	20	Entry: Just to left of mid-line half way between umbilicus and pubis. No exit. Narrow sector, below umbilicus.	Large rivet from accidental explosion.	Very blanched. Pulse 140, thready.	1. Rivet embedded in mesentery of ileum at bowel attachment. Small tear in peritoneal coat of bowel at same site. Tear in mesentery 1 in. long and mesenteric vessels still bleeding. 2. Enormous amount of blood.	1. Right rectus. 2. Bleeding vessels ligatured and hole in mesentery closed. Tear in peritoneal coat of ileum sutured. 3. Pelvis drained.	Evacuated to base; 9 days.	Marked bronchitis; patient also had compound fracture of left radius and ulna near elbow-joint.	—
10	34	Entry: 1½ in. below and 1½ in. to left of umbilicus. No exit. Narrow sector, below umbilicus.	Shrapnel.	Very blanched. Pulse 132, thready.	1. Four perforations in jejunum found and two tears in small intestine mesentery, the vessels of which were still bleeding. 2. Enormous amount of blood.	1. Left rectus. 2. Perforations sutured. Tears in mesentery sutured. 3. Pelvis drained.	Died in 15 hours. Shock and original hæmorrhage.	—	No necropsy.
11	21	Entry: 1 in. below right posterior superior iliac spine. Exit: Bullet lying under skin 2 in. above pubis and 1 in. to left of mid-line in anterior abdominal wall. Narrow sector, below umbilicus.	Bullet.	Pulse 120.	1 Three perforations in ileum; loop of jejunum 10 in. long much damaged; slit longitudinally for 4 in. and three other perforations in it. 2. Much blood and small intestine content.	1. Left rectus. 2. Perforations in ileum sutured. 10 in. of jejunum resected and united by lateral anastomosis. 3. Pelvis drained.	Died 3 days after operation.	Severe diarrhœa on second day; peritonitis.	Necropsy. Anastomosis sound; no lesions missed; very intense general peritonitis; coils of intestine matted together.
12	20	Entry: Just below right posterior superior iliac spine. No exit. Narrow sector, below umbilicus.	,,	Very blanched; no pulse at wrist.	Ileum perforated in three places. Ragged tear in mesentery of ileum 1½ in. long. Vessels still bleeding. 2. Much blood.	Left rectus; bullet found in line of incision lying in muscle. 2. Perforations in ileum sutured; tear in mesentery sutured; still pulseless on leaving table.	Evacuated to base; 21 days.	Blood clot left behind in pelvis suppurated and patient developed signs and	—

		Bullet lying under skin 2 in. above pubis and 1 in. to left of mid-line in anterior abdominal wall. Narrow sector, below umbilicus.			4 in. and three other perforations in it. 2. Much blood and small intestine content.	anastomosis. 3. Pelvis drained.		intense general peritonitis; coils of intestine matted together.
12	29	Entry: Just below right posterior superior iliac spine. No exit. Narrow sector, below umbilicus.	,,	Very blanched; no pulse at wrist.	1. Ileum perforated in three places. Ragged tear in mesentery of ileum ½ in. long. Vessels still bleeding. 2. Much blood.	1. Left rectus; bullet found in line of incision lying in muscle. 2. Perforations in ileum sutured; tear in mesentery sutured; still pulseless on leaving table. 3. Pelvis drained.	Evacuated to base; 21 days.	Blood clot left behind in pelvis suppurated and patient developed signs and symptoms suggesting subdiaphragmatic abscess, but these cleared up without further interference. Very severe hiccough for first 36 hours.	—
13	19	Entry: 3 in. behind left anterior superior iliac spine and 1 in. below crest of ilium. No exit. Wide sector, below umbilicus.	,,	Urine normal. Pulse 100.	1. Last loop of ileum perforated in three places. Much local peritonitis. 2. No bleeding. Large escape of bowel content with marked fæcal odour.	1. Left rectus. 2. Perforations in ileum sutured and liquid fæces carefully mopped up. 3. Pelvis drained.	Evacuated to base; 10 days.	Severe diarhœar on second day; bronchitis. Much discharge from pelvic drain.	—
14	25	Entry: 8th rib left anterior axillary line. Exit: 7th rib right mid-axillary line. Wide sector, above umbilicus.	,,	On admission pulse 88; 3 hours later 120 and hæmatemesis.	1. Two perforations in anterior wall of stomach 1½ in. apart. Tear on under surface of liver still bleeding. Falciform ligament distended with blood. 2. Blood and gas from stomach.	1. Left rectus. 2. Perforations in stomach sutured. Wound on under surface of liver packed with gauze. 3. Gauze drain.	Evacuated to base; 6 days.	—	—
15	14	Entry: 10th rib mid-axillary line. No exit. Wide sector, above umbilicus.	High explosive (bomb).	Very frequent vomiting. Pulse 120.	1. Tear on right side of liver. 2. Much blood.	1. Right rectus. 2. Liver wound packed with gauze. 3. Gauze drain.	Died 5 days after operation.	Patient died quite suddenly with symptoms suggesting secondary hæmorrhage.	No necropsy.
16	22	Entry: Just below 12th rib in left mid-axillary line. No exit. Wide sector, above umbilicus.	High-explosive shell.	Pulse 120.	1. Large tear in anterior wall of descending colon. 2. Some escape of fæcal matter.	1. Left rectus. 2. Perforation stitched. Transverse colotomy. 3. Drainage through lumbar wound.	Evacuated to base; 5 days.	—	—
17	23	Entry: 7–8th rib left posterior axillary line. No exit. Wide sector, above umbilicus.	Shrapnel.	Very blanched. Pulse 132.	1. Tear in lower angle of spleen. No other lesion found. Profuse bleeding. 2. Enormous amount of blood.	1. Left rectus. 2. Spleen tightly packed with gauze. 3. Gauze drain.	Evacuated to base; 9 days.	Packing around spleen removed on fourth day after operation. No fresh bleeding.	—
18	42	Entry: Right posterior axillary line 1 in. below crest of ilium. Exit: Left groin, close to pubic spine. Narrow sector, below umbilicus.	Bullet.	Profuse hæmaturia. On admission pulse 96; 12 hours later 120.	1. Two perforations in last loop of ileum; marked peritonitis. Posterior wall of bladder bruised but not perforated. 2. Much escape of bowel content with marked fæcal odour.	1. Right rectus. 2. Perforations stitched. 3. Pelvis drained.	Died 12 hours after operation. Shock and peritonitis.	—	No necropsy.
19	20	Entry: Three wounds between left 12th rib and iliac crest. No exit. Narrow sector, below umbilicus.	Shrapnel.	Pulse 128.	1. No lesion found except bruise in omentum. 2. Small quantity of free blood in peritoneum.	1. Left rectus. 3. Abdomen closed.	Evacuated to base; 3 days.	—	—
20	35	Entry: 1 in. below sternum and just to right of mid-line. No exit. Narrow sector, above umbilicus.	Bullet.	Very pale. Pulse 120.	1. Large tear on anterior surface of liver; bleeding profusely also from tear on under surface. Bullet passed through gastro-hepatic omentum, just missing stomach. 2. Much blood.	1. Right rectus. 2. Liver packed with gauze. 3. Gauze drain; removed on fourth day.	Evacuated to base; 6 days.	—	—
21	37	Entry: Over left posterior superior iliac spine. Exit: Bullet lying under skin 2 in. above pubis just to left of mid-line. Narrow sector, below umbilicus.	Shrapnel bullet.	Pulse 120.	1. Four perforations in ileum and two in jejunum. Mesentery uninjured. 2. Little blood.	1. Left rectus. 2. Perforations in ileum and jejunum sutured. 3. Pelvis drained.	Evacuated to base; 8 days.	Bronchitis.	—
22	24	Entry: ½ in. below and 1 in. to right of umbilicus. Exit: 2 in. above iliac crest mid-axillary line. Narrow sector, below umbilicus.	Shrapnel.	From exit wound large amount of liquid fæcal matter was escaping. Pulse 120.	1. Loop of ileum perforated in two places, lower tear 3 in. long, also small tear in mesentery of ileum. 2. Small intestine content locally. No blood.	1. Incision over track of missile. 2. 10 in. of ileum resected and end-to-end anastomosis done. 3. Peritoneum drained locally through posterior angle of wound.	Evacuated to base; 7 days.	Bronchitis. Much suppuration of abdominal wound.	—
23	30	Entry: Right mid-axillary line half way between last rib and crest of ilium. No exit. Narrow sector, below umbilicus.	High-explosive shell.	Pulse 100.	1. Irregular piece of copper band found embedded in wall of ascending colon. Lumen of bowel not opened. 2. Little blood.	1. Right rectus. 2. Peritoneal tear in ascending colon sutured. 3. Drained through wound of entrance.	Evacuated to base; 6 days.	Bronchitis.	—
24	21	Entry: Left linea semilunaris 1 in. below umbilicus. No exit. Wide sector, below umbilicus.	Bullet.	From entrance wound there was extruded a small loop of small intestine covered with omentum. Pulse 140, thready.	1. Loop of jejunum 12 in. long found perforated in six places and nearly severed in two places. Knuckle of bowel protruding through wound was also bruised, but uninjured. 2. Much blood.	1. Left rectus. 2. Bullet not found. 1 ft. of jejunum resected and end-to-end anastomosis done. Piece of extruded omentum ligatured and removed. Pulseless on leaving table. 3. Pelvis drained.	Evacuated to base; 11 days.	Bronchitis. Suppuration in entrance wound.	—

PENETRATIVE WOUNDS OF ABDOMEN: TABULAR STATEMENT OF 50 CONSECUTIVE OPERATION CASES—(*Continued*).

No.	Age.	Wounds of entry and exit. Sector of abdomen, above or below umbilicus.	Missile	Special signs or symptoms. Pulse.	1. Lesions found at operation. 2. Peritoneal content.	Treatment: 1. Incision, 2. Of lesion. 3. Drainage of peritoneal cavity.	Result and days in station.	After results: Intra-abdominal; respiratory; abdominal wall.	Necropsy: Whether done; operation area; lesions missed; other facts.
25	19	Entry: ½ in. below right anterior superior iliac spine. No exit. Wide sector, below umbilicus.	Bullet.	Pulse 140, thready.	1. Ileum nearly divided across. Loop of jejunum close to duodenum perforated in six places, nearly across in two places. Bullet found lying free on omentum near lower border of stomach. 2. Much blood.	1. Right rectus. 2. 4 in. of ileum resected, end-to-end anastomosis. 18 in. of jejunum resected, end-to-end anastomosis. Pulse 140 on leaving table. 3. Pelvis drained.	Died 18 hours after operation.	—	Necropsy. Resections perfect. Transverse colon near splenic flexure found to have three perforations in it. Also tear in transverse meso-colon. Marked general peritonitis.
26	26	Entry: Left linea semilunaris just below umbilicus. No exit. Narrow sector, below umbilicus.	Shrapnel.	Pulse 112.	1. Single perforation in jejunum. Missile not recovered. 2. Some blood.	1. Left rectus. 2. Perforation in jejunum sutured. Pulse 120 on leaving table. 3. Pelvis drained.	Evacuated to base; 8 days.	Bronchitis. Some suppuration in lower angle of wound.	—
27	20	Entry: At tip of coccyx. Exit: Large wound just below and to right of umbilicus. Wide sector, below umbilicus.	Bullet.	From exit wound large piece of omentum was extruded. Pulse 140, thready.	1. Loop of ileum 20 in. long perforated in seven places. Ileum perforated in two other places. One perforation of jejunum. Two perforations in iliac colon; one perforation in rectum very low down. 2. Much blood.	1. Left rectus. 2. Loop of ileum 20 in. long resected, end-to-end anastomosis. Perforations in ileum, jejunum, iliac colon, and rectum sutured. 3. Pelvis drained.	Died 12 hours after operation.	—	Necropsy. Sutures and resection apparently perfect. Very little peritonitis. No fresh hæmorrhage. Patient died from shock and hæmorrhage.
28	30	Entry: Loin left side, touching 12th rib, scapular line. Exit: Nil. Course: Posterior abdominal wall, above umbilicus.	Shrapnel.	Hæmaturia. No vomiting. Pulse under 120, moderate quality.	1. Kidney perforated. 2. Full of blood.	1. Centre of left rectus. 2. Drainage of posterior wound. 3. Peritoneal cavity not drained.	Evacuated to base; 7 days.	Urinary fistula posteriorly sixth day.	—
29	33	Entry: Loin left side through 12th rib 2½ in. from mid-line. Exit: Bullet lodged at epigastrium under skin midway between xiphisternum and umbilicus. Narrow sector, above umbilicus.	,,	Hæmaturia. Vomiting marked. Pulse 140, poor.	1. Perforation of kidney and jejunum, two rents. 2. Blood in quantity. No escape of intestinal content.	1. Left rectus. 2. Drainage of posterior wound; suture of perforations. 3. Peritoneal cavity drained.	Death in 14 days. Toxæmia of suppuration in wound.	Slight bronchitis. B. coli suppuration in abdominal wall.	No necropsy. Doubtful if all lesions treated.
30	22	Entry: Left hypochondrium, centre on mid-clavicular line; omental tag protruding. Exit: Nil. Narrow sector, above umbilicus.	Rifle bullet.	Hæmaturia; marked hæmatemesis. Pulse uncountable, thready, and very feeble.	1. Stomach, two rents, one on anterior and one on posterior wall. Jejunum, four holes (rents). Left kidney perforated. 2. Blood, stomach content, gas, and small intestinal content in greater and lesser sacs.	1. Mid-line. 2. Suture of stomach; resection of 3 in. of jejunum; circular anastomosis. 3. Drainage, + of lesser sac.	Evacuated to base; 11 days.	Slight bronchitis.	—
31	30	Entry: Left loin; large laceration 1½ in. across, fracturing 12th rib. Exit: Nil. Course: Posterior abdominal wall, above umbilicus.	High-explosive shell fragment.	Hæmaturia; hæmoptysis; vomited twice. Pulse 130, poor.	1. Left kidney lacerated; good deal of hæmorrhage. Rent in posterior peritoneum. 2. Blood in quantity.	1. Left rectus. 2. Packing of posterior wound. 3. Not drained.	Evacuated to base; 5 days. Improved in general condition.	Fæcal fistula third day. Slight bronchitis.	—
32	23	Entry: Left loin posteriorly, 2 in. above crest of ilium, scapular line. Exit: Nil. Course: Posterior abdominal wall, above umbilicus.	"Whizz-bang" shell fragment.	No vomiting. Pulse 110, good.	1. No intraperitoneal lesion found. 2. Blood in quantity.	1. Left rectus. 2. Drainage of loin wound. 3. Peritoneal cavity not drained.	Evacuated to base; 8 days.	Fæcal fistula second day from posterior wound. Slight bronchitis. Fæcal escape from anterior wound third day.	—
33	15½	Entry: 1½ in. to right of umbilicus and slightly below. Exit: Nil. Wider sector, below umbilicus.	Rifle bullet.	Vomiting present. Pulse thready and feeble.	1. Jejunum, five rents over 8 in. of gut. Ileum, three rents in 3 in. of gut, and one isolated rent. 2. Blood in quantity. Small intestinal content.	1. Right rectus. 2. 9 in. jejunum resected, lateral anastomosis. 4 in. ileum resected, circular anastomosis. Suture of isolated rent. 3. Drainage.	Evacuated to base; 16 days.	Bronchitis. Suppuration of wound, necessitating secondary suture.	—
34	20	Entry: 1 in. above anterior superior spine, 1 in. external to anterior axillary line, left side. Exit: Nil. Wider sector, below umbilicus.	,,	Vomiting present. No radial pulse.	1. Ileum, one isolated perforation, four rents in 4 in. of gut. Descending colon, fixed portion, one rent 1 in. long. 2. Blood in large quantity. Small intestinal content. At least one mass formed fæcal matter.	1. Just external to left rectus. 2. Suture of isolated perforation. Resection 5 in. ileum, circular anastomosis. Suture of rent in colon. 3. Drainage.	Death 29 hours later. General peritonitis and shock.	Regurgitant vomiting.	Necropsy. All lesions satisfactorily dealt with. Early generalised peritonitis.
35	19	Entry: Lacerated wound through twelfth rib right side back just outside erector spinæ. Exit:	"Whizz-bang" shell	Hæmaturia. Vomiting present. Pulse thready, just per-	1. Kidney, soft upper pole, rent made out. Liver damaged. 2. Small amount of blood-stained	1. Right rectus. 2. Nil. 3. Not drained.	Death 24 hours later. Shock.	—	Necropsy. Upper third of kidney

35	19	Entry: Lacerated wound through twelfth rib right side back just outside erector spinæ. Exit: Nil. Wider sector, above umbilicus.	"Whizz-bang" shell fragments.	Hæmaturia. Vomiting present. Pulse thready, just perceptible.	1. Kidney, soft upper pole, rent made out. Liver damaged. 2. Small amount of blood-stained bile.	1. Right rectus. 2. Nil. 3. Not drained.	Death 24 hours later. Shock.	—	Necropsy. Upper third of kidney badly lacerated; also right lobe of liver. Shell fragment 1½ in. long removed from liver.
36	20	Entry: Two small wounds left loin, posterior axillary line, just above anterior superior spine. Exit: Nil. Narrow sector, below umbilicus.	Trench mortar shell fragments.	Vomiting present. Pulse 130, feeble.	1. Jejunum, two perforations. 2. Turbid fluid in peritoneal cavity.	1. External to left rectus. 2. Suture of two perforations. 3. Not drained.	Evacuated to base; 8 days.	Good deal of pain. Bronchitis.	—
37	22	Entry: Right buttock centre at gluteal fold. Exit: Nil. Wider sector, below umbilicus.	High-explosive fragment.	Vomiting present. Pulse 120, moderate.	1. Ileum, four perforations, mesentery four perforations and two contusions. 2. Purulent and feculent fluid in peritoneal cavity.	1. Mesial incision. 2. Resection of 2½ in. ileum, circular anastomosis. Invagination of contused mesentery. 3. Drainage.	Evacuated to base; 6 days.	Slight bronchitis.	—
38	19	Entry: Multiple back, one just below 12th rib right side, deep. Exit: Nil. Above umbilicus.	Shrapnel.	Vomiting present. Hyperæsthesia over right side of abdomen and back. Pulse 120, moderate; under $CHCl_3$ down to 80 and good.	1. Nil. 2. Nil.	1. Right rectus. 2. Nil. 3. Not drained.	Evacuated to base; 5 days.	—	—
39	23	Entry: Epigastric 1 in. to right and 2 in. above umbilicus. Exit: Nil. Narrow sector, above umbilicus.	Rifle bullet.	Vomiting present. Pulse 110, moderate.	1. Jejunum, two large rents involving mesenteric border. Large bleeding rents in great omentum. 2. Blood and intestinal content.	1. Right rectus. 2. Jejunum resection 4 in., circular anastomosis. Omentum sutured. 3. Not drained.	Evacuated to base; 36 days later.	Serious and obstinate purulent bronchitis. Marked suppuration of wound necessitating secondary suture 19 days later.	—
40	26	Entry: Epigastric ½ in. to left of mid-line 2 in. from xiphisternum. Exit: Nil. Wider sector, above umbilicus.	High explosive.	Vomiting present. Pulse thready, barely perceptible.	1. Jejunum: (*a*) Four small perforations, isolated. (*b*) In 8 in. of gut five rents; two rents of mesentery. (*c*) In 3 in. of gut two large rents. In great omentum one rent. 2. Blood, small intestinal content, lymph in quantity.	1. Right rectus. 2. Jejunum: (*a*) Four holes sutured. (*b*) Resection 9 in., circular anastomosis. (*c*) Resection 4 in., circular anastomosis. 3. Drainage.	Death 5 hours later. Shock and hæmorrhage.	—	Necropsy. All lesions dealt with.
41	34	Entry: Left buttock. Exit: About midway between umbilicus and symphysis; rent 1 in. in diameter. Wider sector, below umbilicus.	Rifle bullet.	Vomiting present. Pulse thready, barely perceptible.	1. Ileum: (*a*) In 20 in. of gut ten perforations and rents of various sizes and shapes. (*b*) Isolated rent. Mesentery: One large rent, bleeding. 2. Blood, gas, small extravasation, fæcal matter.	1. Left rectus. 2. Ileum: (*a*) 21 in. resected, lateral anastomosis. (*b*) Suture of isolated rent. 3. Drainage.	Evacuated to base; 13 days.	Marked hiccough; regurgitant vomiting. Bronchitis. B. coli suppuration in exit wound; secondary infection of sutures. No need for secondary suture.	—
42	20	Entry: 1 in. to left of mid-line just below 12th rib. Exit: Nil. Wider sector, above umbilicus.	Shrapnel bullet.	Sighing, rapid catchy respirations. Vomiting. Pulse absent at first, three hours later just perceptible.	1. Diaphragmatic rent 2 in. long. Hernia of 3 or 4 ft. of jejunum through diaphragm, one coil of which four perforations; splenic flexure colon two rents. 2. Blood in large quantity.	1. Mesial incision, 2nd oblique from umbilicus to lower costal margin. 2. Suture of diaphragm not complete, operation abandoned, patient moribund.	Death half hour later. Shock and hæmorrhage.	—	Necropsy. Great omentum spread over base of left lung. Bullet removed from left lung.
43	28	Entry: Just below 12th rib posterior axillary line. Exit: 1 in. below xiphisternum mid-line. Wider sector, above umbilicus.	Rifle bullet.	No vomiting. Pulse 84, rose to 110 in 24 hours, during which he was watched.	1. Liver perforated and bleeding. Gastro-hepatic omentum scored. 2. Blood and bile in large quantity.	1. Right rectus. 2. Liver packed to stop hæmorrhage. 3. Drainage.	Evacuated to base; 10 days.	Delirious for 48 hours. Vomiting. Marked bronchitis.	—
44	19	Entry: Left hypochondrium below costal margin anterior axillary line. Exit: Nil. Narrow sector, above umbilicus.	,,	No vomiting. Pulse 90, good.	1. Bullet lodged behind peritoneum below spleen. Palpated with ease. 2. Nil abnormal.	1. Outer side left rectus. 2. Bullet left *in situ*. 3. Drainage.	Evacuated to base; 6 days.	—	—
45	24	Entry: McBurney's point right side lower abdomen. Exit: Nil. Wider sector below umbilicus.	,,	Vomiting present. Pulse 80, good	1. Ileum perforated in six places, bullet peeping through one coil, having just penetrated. 2. Purulent fluid as in suppurative appendicitis.	1. Outer side right rectus. 2. Ileum suture of six perforations. Appendectomy. 3. Drainage.	Evacuated to base; 6 days.	Slight bronchitis.	—
46	23	Entry: Multiple wounds back. One on right side below 12th rib 1½ in. from mid-line, admitting whole length of forefinger towards peritoneal cavity. Exit: Nil. Non-penetrative, above umbilicus.	High explosive.	Vomiting present. Pulse 130, feeble.	1. Piece of shell and clothing removed lying in contact outer side of peritoneum left loin. 2. Nil abnormal.	1. Right rectus. 2. Wounds cleansed. Pieces of shell removed. 3. Peritoneal cavity not drained.	Evacuated to base; 8 days.	No bronchitis.	—

PENETRATIVE WOUNDS OF ABDOMEN: TABULAR STATEMENT OF 50 CONSECUTIVE OPERATION CASES—(*Continued*).

No.	Age	Wounds of entry and exit. Sector of abdomen, above or below umbilicus.	Missile.	Special signs or symptoms. Pulse.	1. Lesions found at operation. 2. Peritoneal content.	Treatment: 1. Incision. 2. Of lesion. 3. Drainage of peritoneal cavity.	Result and days in station.	After results: Intra-abdominal; respiratory; abdominal wall.	Necropsy: Whether done; operation area; lesions missed; other facts.
47	20	Entry: 1 in. below and 1 in. to left of umbilicus. Exit: Nil. Narrow sector, below umbilicus.	Rifle bullet.	No vomiting. Pulse 100, good.	1. Ileum, three perforations; mesentery, one perforation; two bruises. 2. Blood in quantity.	1. Left rectus. 2. Ileum, perforations sutured; mesentery, hole sutured; bruises invaginated. 3. Drainage.	Evacuated to base; 7 days.	Bronchitis.	—
48	31	Entry: Right buttock just posterior to great trochanter 1 in. below tip. Exit: Nil. Wider sector, below umbilicus.	"	Hæmaturia. Vomiting present. Flicker occasionally, otherwise pulseless.	1. Ileum: (*a*) One isolated perforation. (*b*) Ten perforations and rents in 13 in. small intestine. Mesentery: Four large rents; bleeding still. 2. Blood and small intestinal content.	1. Mid-line. 2. Ileum: (*a*) Single perforation, sutured. (*b*) 14 in. resected, lateral anastomosis. 3. Drainage.	Death half hour later. Shock and hæmorrhage previous to operation.	—	Necropsy. Sutures satisfactory. No lesions missed. Side of bladder contused.
49	21	Entry: McBurney's point, right lower abdomen. Exit: Bullet lodged under skin, left buttock. Wider sector, below umbilicus.	Shrapnel bullet.	Vomiting present. No radial pulse.	1. Pelvic colon, two rents. Ileum, 11 rents in 44 in., necessitating three different resections or one large one. Mesentery, five different rents. 2. Blood, small intestinal content, gas.	1. Right rectus. 2. Pelvic colon sutured. Ileum, 44 in. resected. Ileocolo-tomy end to side just above cæcum. 3. Drainage.	Death while suturing wall of abdomen. Shock and previous hæmorrhage.	—	Necropsy. Operation area satisfactory. No lesions missed.
50	23	Entry: Just below xiphisternum and 1 in. to right of mid-line. Exit: Nil. Wider sector, above umbilicus.	High-explosive fragment.	Vomiting present. No radial pulse.	1. Liver badly lacerated. Stomach rent in lesser curvature. Gastro-hepatic omentum torn. Duodeno-jejunal flexure two rents. 2. Blood, bile, intestinal content.	1. Mid-line. 2. Stomach, rent sutured. Liver, two torn fragments 1 in. square resected; sutured. Jejunum sutured. 3. Drainage.	Death 8 hours later. Shock and hæmorrhage.	—	Necropsy. Operation area satisfactory. Two holes in third part of duodenum missed.

that many of our patients who seemed to be doing well ultimately died from peritonitis, and we also found by making post-mortem examinations that the lesions of the viscera were generally so severe and extensive that they could not possibly repair themselves. We further found that hæmorrhage from vessels which could have been tied was a common cause of death, and we also noticed that in many cases of injury of the small intestine there was very little immediate escape of contents and soiling of the peritoneum, so that the conditions for operation were better than we had expected.

It is easy enough now to realise these facts, but preconceived ideas die hard, and early in the war there was too great a rush of events to give time for investigation. During the retreat, and the battles of the Marne and the Aisne, the various medical units had more work than they could well do, and in the fierce fighting at Ypres we were always struggling with even larger numbers of wounded. In spite of these difficulties a certain number of abdominal operations were done, but the results obtained rather deterred than encouraged the operators. It was not till this period was passed that it became possible to equip the casualty clearing stations for their new rôle as emergency hospitals and to make post-mortem examinations. Early in the past year Captain Owen Richards had several successful cases of intestinal resection and suture, and during the ensuing spring and summer more and more cases were operated upon with gradually increasing success, so that ultimately for the past five or six months it has come to be the custom to look upon all abdominal wounds as probable cases for operation.

The effect of this new outlook has been that instead of patients being kept in field ambulances they are despatched as speedily as possible to the casualty clearing stations, and I have seen patients on the operating table within two and a half hours of being hit in the trenches, and just in time to save life from hæmorrhage.

The essentials for success in operations upon gunshot wounds of the abdomen may be briefly stated as follows:—1. Rapid transport to hospital. 2. Suitable antiseptic and aseptic conditions for operation. 3. Good nursing and suitable feeding. 4. Opportunity for retaining the patient for at least a week or 10 days before evacuation.

I am altogether opposed to the idea of operating in "dug-outs" or ruined houses close to the trenches, or in field ambulances which may have to be suddenly emptied. In the former the conditions necessary for success in the operation itself cannot be provided, and in neither can the patient be kept as long as is essential if he is to be given the best chance of recovery. It may be admitted that it is not a good thing for a wounded man to have to be driven several miles before an operation is done, but it must be also realised that it is a much worse thing to drive him the same distance directly after an operation, and, as he cannot be left indefinitely in a dug-out or a field ambulance, the sooner his journey is started and got over, and the earlier he gets to a place where he can remain, the more chance will the surgeon have of doing his best for his patient.

Both post-mortem examinations and operations have convinced everyone that the majority of patients who die with perforating abdominal wounds die from hæmorrhage, and we are all also agreed that if the intestine is opened by a bullet or shell fragment the patient will almost certainly die from peritonitis if he does not die from bleeding.

The reason for this opinion is not based merely on clinical observations, but on the very extensive and numerous lesions which are so often found, and which are well illustrated in the present paper. We have also learned by operations that both bullets and shell fragments may traverse the intestinal area without wounding the bowel, and that many wounds which appear to perforate do not really do so. Another striking fact of much practical importance is that no less than 24 wounds out of the total of 50 were due to missiles which entered the flanks or the gluteal region, while in other cases the wound of entry may be through the chest or even through the shoulder or neck.

It will be noticed that out of a total of 91 patients admitted 41 were not operated upon, 17 of them because they were past help, and the remaining 24 because it was not considered necessary. All of the latter recovered—a fact which demonstrates that selection is justifiable. My own advice has been that all wounds without exception which seem likely to involve the area of the small or large intestine should be subjected to an exploratory operation, and that a laparotomy should be done if the peritoneum is found to have been involved. Operation should also be done in all those wounds of the gluteal and lumbar regions where the symptoms point to a visceral lesion. I do not advise operation in the epigastric or hepatic regions, especially in antero-posterior wounds, if there are no definite symptoms, but if there is evidence of continuing bleeding then operation should be undertaken. The same holds good of the renal and splenic regions, but it is too early to regard these opinions as final.

It will be seen that the intestines or the stomach were wounded in 34 cases out of the total of 50, and that of these patients no less than 21 recovered in spite of multiple perforations in many cases and of serious injury to other viscera as well. Resection appears at first sight to be much more fatal than suture, but it must be remembered that the injuries which necessitated resection were also much the more serious and that the patients were far more ill.

It may fairly be claimed that in all the cases of wounds of the intestine and in most of the others who recovered the lives of the patients were saved by the operation.

THE TREATMENT OF "CONCUSSION BLINDNESS."

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ONE of the principal ocular features of the present war is the number of cases of functional blindness due to the violent explosions caused by high explosive shells, bombs, hand-grenades, &c. These cases may or may not have sustained definite organic injuries, but the clinical symptoms characterising their functional nature are very clearly marked. Usually the patient has been rendered unconscious by an explosion in his close vicinity, and on regaining consciousness he finds that he is unable to see. When examined he presents the following symptoms. The eyes are kept closed, the lids may be frequently "fluttered," or as one man stated, "he could not keep his eyes from twinkling." On attempting to open the lids the patient resists forcibly by means of his orbicularis; when this is overcome to a sufficient extent to see the globes, they are found to be rolled forcibly upwards, and the pupils are always kept covered by the lids; he has great difficulty in looking downwards, and complains of pain and photophobia, and shows marked fatigue as a result of the examination. In some cases I (A. W. O.) have noticed an acceleration of the pulse-rate and also perspiration. The photophobia is not, however, really influenced by light, as the condition does not diminish in very subdued illumination. These patients never move about as blind men would; they invariably avoid hurting themselves, but all the same they never relax, even if watched for weeks at a time, the groping action of people with extremely defective sight, and judged by every test they maintain this condition indefinitely and are undoubtedly psychically blind. The pupils react normally and the fundus shows no definite change. There is no difficulty in differentiating them from malingerers, as they pass through long periods of real mental distress and serious discomfort. These cases vary enormously in severity; some recover rapidly, others seem to go on indefinitely if not treated, or treated unsuccessfully. Any lack of recognition of the condition in the early stages enormously prejudices the prognosis. One patient having been told that he was blind remained so for several months, whereas probably if it had been recognised earlier that he was not blind and would recover he would have done so much more rapidly.

Early in the war I treated these cases in several ways, all with disappointing results; some of the slighter cases certainly did recover, but they recovered in spite of treatment and not on account of it. The main principles on which I worked were rest, tonics, deprivation or punishments, such as abstention from tobacco, confinement to bed or in isolation rooms, persuasion, encouragement, counter-irritation, talking, &c., but all these means were comparatively ineffective until suggestion and hypnosis were tried. In August, 1915, I thought it would be advisable to try suggestion, although I had a strong personal prejudice against its use, but when later on these cases still remained on my hands I consulted with Dr. Hertz, and we decided to start the hypnotic treatment. The method employed was to have the men singly in a darkened room, quiet, and resting in the most comfortable armchair the ward could provide. They were instructed as to what was to be attempted, and no demur was ever made by any of them, but, on the contrary, after the first experience they were always eager to continue the treatment. The patient had his eyes closed, of course, so that the assistance of light and fixation could not be obtained; but he was told to think of something pleasant and agreeable, not to take the slightest notice of the operator, to relax his mind by attempting to stop all incoming thoughts and to make his mind, as far as possible, a blank. We then used the usual methods of inducing hypnosis. In some cases—for example, Case 1—the hypnotic condition was obtained, but not in all, and I do not think it at all necessary to obtain complete unconsciousness; the main thing to be arrived at is to obtain a relaxation of the patient's mind and his muscles and to overcome his unconscious resistance.

The treatment is carried on thus for a few minutes, and having obtained the sleepiness or light hypnosis necessary, the patient is subjected

to a forcible suggestion from the operator, who reiterates the patient's ability to see and to open his eyes, and to assert very vehemently that he is not blind as he imagines, but that his eyes are perfectly sound and that he *can* see.

The results have varied considerably as to rapidity of recovery, but all have shown marked improvement, the most drastic being that of the patient in Case 1, the most resistant being the deaf and blind man (Case 5). Cases of this nature have been constantly arriving from France and Gallipoli, but I here insert the notes sent to me by Dr. Hertz immediately previous to his departure for Alexandria, as they were the earliest ones with which we dealt and are quite typical, and in all of them, except in the last case, Dr. Hertz collaborated with me in their treatment; they, however, only represent a small proportion of the total number of cases.

Notes of Cases by DR. HERTZ.

CASE 1.—The patient, aged 22, was looking over a parapet on July 18th, 1915, when a shell struck the sandbags in front of him. He remembers the sand being thrown up into his eyes and his falling back so that he knocked his head. He remained unconscious for 24 hours. When he regained consciousness he found that he was completely blind, except that he could just distinguish light from darkness with his left eye. His eyes felt very sore and his eyelids were constantly moving up and down; he was partially deaf and had a severe headache. His hearing soon returned, and the headache rapidly improved, but the condition of his eyes had not altered when I first saw him with Mr. Ormond on Sept. 17th. He was quite blind and there was a constant flicker of his eyelids, which were kept almost closed. On forcibly opening his eyes they were found to be turned so far upwards that it was difficult to see even the iris. A few fragments of sand were still embedded in the conjunctiva but not in the cornea; there was no inflammation present.

The patient was easily hypnotised, and whilst asleep he was told that he would be able to see when he woke up. The moment he awoke the suggestion was repeated very forcibly, and his eyes were held open. He cried out that he could see, tears ran down his cheeks, and he fell on his knees in gratitude, as he thought that he was permanently blind, and believed that his sight had been restored by a miracle. When seen again on Sept. 20th the external appearance of his eyes was normal, and he said that he was able to see as well as he had ever done. Mr. Ormond, however, found that there was some opacity of the vitreous of the left eye, secondary to hæmorrhage from a retinal vessel, which had ploughed its way forward; this was doubtless a result of injury at the time of the explosion. There has been no return of symptoms, and the patient was well in every way when I last saw him on Sept. 30th. His vision was 6/6 in the right eye and 6/36 in the left.

CASE 2.—The patient had an attack of blindness resulting from conjunctivitis caused by a sandstorm when in Egypt early in 1915. He recovered from this after ten weeks, and six weeks later went to the Dardanelles. On July 12th a shell struck a sandbag immediately in front of him and the sand flew into his eyes. He did not lose consciousness, but his sight gradually became more and more deficient until at the end of ten days he was only just able to distinguish light from darkness. Very slight improvement occurred spontaneously, but his condition when seen on Sept. 17th was identical with that of the patient in the preceding case, a few pieces of grit being still embedded in the conjunctiva, although there was no inflammation.

The patient was easily hypnotised, but there was very little improvement at the moment. Considerable improvement, however, occurred during the next three days. He was hypnotised on three more occasions; he could see perfectly well on Sept. 30th, but still had some photophobia and wore dark glasses, as he could not avoid constantly blinking when they were removed. He was therefore hypnotised yet again, and it was suggested to him that the photophobia and blinking would now cease. The result was completely successful, as all symptoms had disappeared by Oct. 4th, although no attempt had been made to remove the grit from the conjunctiva.

CASE 3.—The patient, aged 20, was rendered unconscious for a few minutes as a result of the explosion of a shell near him on August 21st in the Dardanelles. Some of the powder was blown into his eyes, which were very sore when he regained consciousness, although he was still able to see quite well. During the next 24 hours his vision became more and more impaired. The powder was removed from his eyes when he was taken on board the hospital ship, and his eyes were bandaged. After a few days he thought he would be able to see quite well if the bandages were removed, but the medical officer in charge told him that it would be dangerous to do so. During the voyage home he was not allowed to remove the bandages, and he became more and more convinced that this must be because the medical officer thought he was olind. The bandages had not been removed when he was admitted into the hospital on Sept. 25th. When they were removed he was found to be in exactly the same condition as the preceding patients. He could distinguish light from darkness, but was unable to see anything, and he kept his eyes turned up and his eyelids closed and constantly contracting.

On Sept. 27th he was hypnotised by Mr. Ormond, after which he found that he could see quite well, but the light still worried him and the blinking continued, though to a diminished extent. He completely recovered subsequently and returned to his depôt.

CASE 4.—The patient, aged 29, was knocked over by a high explosive shell in the Dardanelles and remained unconscious for a considerable time. On coming round he found he could only distinguish light from darkness; there was no smarting of the eyes, but he constantly blinked. He had a slight headache, but was otherwise well. He began to improve about Sept. 10th, so that he could recognise shadows passing in front of his eyes, but no further improvement occurred until he was hypnotised on Sept. 18th. There was very slight improvement as the result of suggestion at the time, but when seen again on the 20th he said that he was beginning to recognise objects, and the blinking was less marked than before, but he still kept his eyeballs turned upwards and his eyes almost closed. He was hypnotised again on Sept. 20th and 25th, and when seen on the 30th his sight was quite normal and the blinking had completely ceased. Subsequent retinoscopic examination revealed the presence of a considerable degree of myopic astigmatism in the right eye and mixed astigmatism in the left.

CASE 5.—The patient was signalling from a gun limber on April 28th when he was blown up and remained unconscious for six days. There was no external wound, but on regaining consciousness he found that he was blind, except that he could just distinguish light from darkness; he was also completely deaf and was unable to speak. He regained his speech in June, after a fortnight's treatment by hypnotism at Plymouth, but his sight and hearing remained unaltered.

When I saw the patient on Sept. 17th he could only be made to hear by shouting down an ear-trumpet; he kept his eyelids almost closed and constantly twitching with his eyeballs turned upwards. He was extremely depressed, as he had been told by an aurist that he would never regain his hearing, as it was said that nerve deafness of such long duration could not improve, although the drums were intact. He concluded that the blindness would also be permanent. It was not easy to hypnotise him as he was unable to see, and all suggestions had to be shouted down his trumpet, but Mr. Ormond succeeded in doing this at the first attempt. When seen on Sept. 20th he said that his sight was distinctly better, and he was able with difficulty to open his eyes. He was much more cheerful, particularly when we told him that his hearing would also return, as his auditory nerves were no more organically diseased than his optic nerves. On Sept. 30th there was some further improvement, as he could see everything in the outer part of his left field of vision fairly well. He was having a good deal of domestic worry, which no doubt prevented a more rapid improvement.

CASE 6.—The patient was unconscious for an hour after being blown up by a shell on August 7th. He was unable even to distinguish light from darkness when he recovered consciousness, but he very gradually improved. He was admitted into the hospital on August 22nd, after which improvement was much more rapid, and by the middle of September he had quite recovered without any special treatment.

CASE 7.—The patient, aged 20, had never used his left eye owing to an extreme degree of hypermetropia and amblyopia.

When the other eye was covered he could only see very indistinctly with it, but in spite of this he managed to pass the medical examination when he entered the army. He was hit on the left side of the head by the butt of a rifle in June and was unconscious for a few minutes. When he regained consciousness he at once noticed that he could not see at all with his left eye, although he had hitherto been in the habit of neglecting the blurred image he saw with this eye. On August 10th he received a slight wound to his left thigh, but continued on duty. The wound had not completely healed, and was still somewhat painful when, on August 23rd, he was blown up by a high explosive shell. When he regained consciousness he was being carried on a stretcher. The pain from his old wound drew his attention to his left leg, and he thought that he was unable to walk. When taken on the ship he found that this was the case, although there was no new injury of the leg. He also complained of severe pain above the left eye, which he kept covered by a shade, as he found that the least light greatly increased the headache; when the shade was removed he was unable to open the eye at all. For some time he was in an extremely excited condition, and he slept very badly owing to nightmares. His eye was kept covered by a shade during his journey home from the Dardanelles. On his arrival in England Mr. C. M. Ryley found that beyond the hypermetropia his left eye was normal, although he was quite unable to see anything with it.

The patient was hypnotised on four different occasions. After the first he already slept better, the nightmares ceasing and the headache being less severe. On the second occasion, whilst still asleep, the shade was removed from his eye and he did not discover until half an hour after he woke up that it was no longer present, although up to that time he said that the least light caused extreme discomfort and spasm of the eyelid. After the third treatment he found that he could see almost as well with his left eye as before he was hit on the head. Meanwhile, he was still unable to walk without crutches, although the wound in the leg had completely healed, and there was no physical cause to account for this. When he was hypnotised for the fourth time it was therefore suggested to him that he would be able to walk quite well, and he subsequently recovered entirely.

These cases are typical of many others that have been treated similarly; in fact, fresh cases of this same condition are arriving every week and the "suggestion" treatment has not failed to give marked improvement in every instance. Up to the present we have had no failures, although the patient in Case 5 has proved the most resistant, but his deafness and domestic trouble, together with the very unfortunate handling of the case in the early stages, have no doubt been responsible for this. Mr. Francis Brook very kindly undertook the later stages of his treatment for me (A. W. O.), as owing to his greater experience in this work I thought he might obtain better results than I had effected. In November the patient was given an anæsthetic, and suggestion was tried during the stage of semi-consciousness, with marked success, as on the following day he opened his eyes voluntarily and has kept them open ever since. His speech and his sight having now returned, we hope that his hearing will not be long delayed.

Dr. Hertz and I trust that by publishing these cases greater attention may be drawn to these conditions, so that even if treatment cannot be applied at once the cases may not be prejudiced unfavourably by injudicious handling.

It is probable that the presence of sand, grit, &c., in the conjunctival sacs of some of these patients may have been the cause of the "suggestion" of blindness, but it was not present in all cases, and recovery took place without its being removed; as a matter of fact, they were, when present, all embedded in the conjunctiva and did not produce any irritative symptoms at the time the patients were under treatment.

A NOTE ON WIDAL'S REACTION WITH STANDARDISED AGGLUTINABLE CULTURES,

TOGETHER WITH REMARKS ON THE IMPORTANCE OF METHOD IN RELATION TO AGGLUTINATION TESTS.

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IT will be generally agreed that at the present time, when large numbers of cases of febrile intestinal disorder are being admitted to military hospitals in this country and elsewhere, the routine use of reliable, accurate, and rapid methods of bacteriological diagnosis is a matter of more than usual importance. Particularly is this the case in relation to the application of agglutination tests in the diagnosis of typhoid and the paratyphoid fevers.

The Microscopic Method.

During the last ten years there has been a gradual consensus of opinion among those who have studied the subject in the greatest detail that macroscopic methods of carrying out the Widal reaction are both simpler and more reliable than the microscopic method. Nevertheless, the microscopic method still appears to possess somewhat numerous adherents in this country as a routine procedure. And the opinion has been again put forward quite lately by Tidy[1] that microscopic and macroscopic methods are equally reliable for diagnostic work. This is perhaps true in the sense, but only in the sense, that any method will enable the observer to report that agglutination did or did not occur in particular dilutions of the patient's serum. Doubtless, also, if agglutination has been obtained by the microscopic method in a sufficiently high dilution of the serum in an *uninoculated* individual, a *positive* diagnosis may be given with reasonable certainty.

But that the percentage of correct results, positive and negative, obtained by microscopic methods approaches anywhere near the degree of accuracy obtainable by the best macroscopic methods of performing the test cannot be substantiated by evidence. Indeed, so numerous are the irregularities and the pitfalls in the agglutination test as carried out under the microscope, and so greatly are its difficulties increased where *inoculated* individuals are concerned that the results are often practically valueless in diagnosis, and may even be entirely misleading.

What are these difficulties and irregularities, and how do they arise? The position may be indicated broadly in the following manner. Typhoid agglutinins, for example, may be present in the blood in appreciable amouuts for one of several reasons. 1. The patient may have active typhoid fever. 2. He may be convalescent from the active disease. 3. He may have had typhoid fever in the past with persisting agglutinins. 4. He may be a typhoid carrier with an agglutinating serum. 5. He may be an inoculated individual. Now any one of these conditions may be associated with pyrexia and undiagnosed intestinal disorder requiring the application of agglutination tests. But in many cases the various conditions just enumerated are not distinguishable by Widal's reaction unless a method is used which allows one to determine

whether, and if so how much, the titre of the patient's serum alters from day to day or at intervals of several days. This, however, for reasons which will be explained immediately, is impossible by the microscopic method unless the changes in the titre are very great. With appropriate modifications similar statements hold with reference to paratyphoid agglutinins.

On the other hand, in cases and at stages when the titre of agglutination is low agglutination may not be detected by the microscopic method and the case returned as negative because the culture employed on that occasion happens to be one of relatively low sensitiveness to agglutination or the emulsion too dense. When it is added that the precautions and controls against spontaneous agglutination may fail to be adequate in a proportion of cases abundant grounds are present to explain the conviction which at an earlier period in the war was being forced upon clinicians, and was expressed by Colonel Sir Bertrand Dawson [2] in quite definite terms to the effect that agglutination tests, as performed, often failed to afford reliable guidance in the diagnosis of typhoid and the paratyphoid fevers "owing to the failure of the Widal test due to inoculation" and to the fact that it was "eccentric," varied from positive to negative on successive days, and might be negative though typhoid bacilli were actually found in the blood. Yet when carried out by accurate quantitative macroscopic methods agglutination offers far the simplest and most delicate test which we possess for the recognition of these particular infections.

The reasons why the microscopic method entirely fails to give comparable quantitative measures of the titre of a patient's serum on successive occasions are the following.

1. The bacterial emulsions or bouillon cultures employed are of an undetermined and inconstant bacterial content. They possess no fixed and definite density, and are not twice alike. Nor is it known to what extent they differ. Yet it was shown long ago by Sacquépée [3] and is now familiar that the agglutinating power of one and the same serum will vary by *100 per cent.* and more with the density or thinness of the emulsion used.

2. Cultures vary very greatly in their degree of sensitiveness to agglutination, so that different subcultures derived from the same stock may differ in sensitiveness to agglutination by *100 or 200 per cent.*

3. As Bossaert [4] and others showed the precise age of the culture used affects in an important degree the sensitiveness of the culture to agglutination, particularly in the case of bouillon cultures.

4. Slight differences in the culture medium concerning the quality of the meat extract used in its preparation, the precise chemical reaction of the finished product, the proportion of salts present and other factors may greatly affect the sensitiveness of the culture to agglutination.

It follows that the microscopic method with fresh living cultures (the method cannot satisfactorily be made use of with killed cultures) is liable to variations of some hundreds per cent. It cannot therefore indicate *with certainty* any changes in the agglutination titre of the patient's serum at successive examinations unless the changes are so very large as to fall outside the limits of these errors. Within these limits such changes as appear to be indicated are as likely to be due to the inherent errors of the method as to any actual change in the titre of the serum, while on the other hand the method may for the same reasons fail to reveal an alteration in agglutination titre even when a change of magnitude has taken place.

Incidentally these facts explain how it is that, while it has been clearly shown by quantitative macroscopic methods that in typhoid fever,[5] in inoculated persons,[6] and in inoculated experimental animals [7] the course of agglutination followed from day to day pursues a regular curve, other observers using other methods find the trace composed only of a series of irregular jumps. Of the fact that gross irregularities of this character are inherent in the microscopic method anyone may readily convince himself who will take the trouble to test one and the same known agglutinating serum by this procedure on a succession of different occasions.

It is not intended for a moment to imply by what has here been said that the microscopic method will not in experienced hands give, earlier or later in the course of the disease, a correct answer, Yes or No, to the diagnostic question in a large proportion of straightforward cases; but will very often fail to afford the evidence required in the conditions of doubt laid down above.

What is required in these cases is not a simple answer, Yes or No, but sufficient evidence on which to form a judgment whether the agglutination titre is rising, or falling, or maintains an approximately steady level during a period of observation. Further, the method used must be one which is not likely to fail whenever any special difficulty is encountered.

The Macroscopic Method.

The sedimentation method introduced by Almroth Wright [8] in 1897 constituted an important advance in the technique of the Widal reaction. But Madsen [9] in 1902 was the first to devise a really accurate method of measuring the agglutinating power of immune serum. It is not, however, always possible to make measurements by Madsen's method, nor is the method one so easily applicable in diagnostic work. Madsen used bouillon cultures to which 1/5000 formol was added just before use. During the succeeding years a number of observers advocated the use of cultures killed by formol and in various other ways for the performance of agglutination tests. It is impossible in a short space to discuss in detail the various modifications of the macroscopic method. But beyond question the best and most generally useful of these methods for accuracy, precision, simplicity, and safety was that devised by Dreyer [10] published in 1906 after several years of careful trial and experimentation, and made more generally known to English workers by translation in the *Journal of Pathology and Bacteriology* in 1909.

In experimental work a long series of tubes is used in which the quantity of serum in each tube is approximately 80 per cent. of that in the immediately preceding tube, all the measurements being made by means of accurately calibrated pipettes. For diagnostic work a short series of small tubes is used and the measurements are made with a dropping pipette. Each tube is made to contain exactly the same quantity of killed agglutinable culture and exactly the same total volume of fluid.

The accuracy of the method in the diagnosis of enteric fever may be judged from the fact that during the first two complete years of its use in the laboratory of the Copenhagen Board of Health (1906, 1907), when the number of samples of blood examined reached a total of 556, a positive reaction

was obtained in 99·1 per cent. of the cases which proved to be typhoid fever and a negative result was arrived at in 98·77 per cent. of the cases which proved not to be typhoid fever.[10]

As originally applied, two series of five tubes were used and the serum tested both against B. typhosus and B. paratyphosus (B). But present conditions are met by the use of three series of tubes in each stand, and the serum is tested simultaneously against B. typhosus and both the paratyphoid bacilli, as described in detail in the early part of this year.[6] A very thin emulsion of standardised opacity is used, thus getting rid of all the irregularities above referred to which are produced by the use of too dense emulsions and emulsions of varying and undetermined density. The reaction always proceeds in the same total quantity of fluid and in the presence of a constant quantum of bacteria. The killed agglutinable cultures are prepared from strains of bacteria specially selected and manipulated to ensure a high degree of sensitiveness to agglutination, as well as to avoid spontaneous agglutination against which controls are put up with each agglutination test, though the phenomenon is practically never met with in the standardised cultures. Further, the degree or sensitiveness to agglutination—i.e., the agglutinability—of each batch of culture is accurately determined in terms of the original standard culture, and is expressed by means of a standardising factor.

The reading is taken by noting the highest dilution in which marked agglutination (without sedimentation) can be detected by the naked eye. This degree of agglutination is termed standard agglutination, and may very simply be expressed in standard agglutinin units by reference to the standardising factor of the particular standardised agglutinable culture employed.

Dreyer's method has now been tested for more than ten years, not only in experimental investigations, but also in routine laboratory work and ordinary class teaching. It is not likely, therefore, that any important new difficulties will arise in its use in ordinary routine diagnostic work.

Since the early summer of this year standardised agglutinable cultures of B. typhosus, B. paratyphosus (A), and B. paratyphosus (B), and standard agglutinating serums for these micro-organisms have been made widely available by the Medical Research Committee on whose behalf they are issued * (with directions for use and diagnostic data). Not the least benefit which will acrue from this action will be the collection from many parts of the world of an extensive material of exact and comparable data. For the individual worker the use of these preparations offers the following advantages:—

1. They are absolutely sterile and require no expert knowledge in handling.

2. They are always ready, there is no making of cultures in advance or preparing of emulsions.

3. The method is extremely simple, so that if need be an intelligent attendant can easily be taught to set up the tests.

4. The readings are quite clear and definite and are quickly made.

5. The standardised agglutinable cultures are highly sensitive to agglutination and they can be kept unchanged for a year or longer.

The employment of an accurate quantitative method of carrying out agglutination tests possesses special value in the diagnosis of the presence or absence of active typhoid or paratyphoid infection in (typhoid) inoculated persons. If, and wherever, a mixed inoculation is brought into use it will become essential to use some such method in order to distinguish the persisting inoculation-titre of the serum from the titre of active infection, since in inoculated individuals the agglutination curve of active infection is *superposed* on the agglutination curve of past inoculation. By the time infection takes place the latter will probably have reached a stage of decline in which it has become to all intents and purposes a level line in observations made at a few days' interval, so that in reality the agglutination curve of active infection starts in these cases from a raised base line. Recently, however, statements are reported to have been given currency by Tidy[1] to the effect that "febrile conditions apparently removed the agglutinins to bacillus typhosus from the blood"; that "a positive Widal reaction was equally valuable in the case of the inoculated and the uninoculated"; and that "after having disappeared the agglutinins perhaps return, but this is not usual." All this would naturally lead to the conclusion that if typhoid agglutinins be found in the blood during or subsequently to some still undiagnosed febrile affection their presence is to be attributed to active typhoid infection. This is not at all the case. But it is to be feared that if the view in question were to gain general acceptation a very large number of the typhoid-inoculated individuals who developed a febrile disturbance would if examined be returned as cases of typhoid fever. Such a statement, therefore, justifies a definite contradiction. The effect of paratyphoid infection, for example, on the typhoid agglutinins of inoculated individuals, examined at such time as they are admitted to hospital, is either to leave the typhoid titre *unchanged*, or to produce a *rise* of greater or less degree.[6] And this agrees with what has been familiar in animals for a number of years.[7] Thus if an animal which has been immunised some weeks or a month or two before with a particular micro-organism be inoculated with a non-lethal dose of a vaccine prepared from some other micro-organism its agglutination titre for the first micro-organism exhibits a new rapid rise of greater or less extent and pursues a curve similar to the ordinary inoculation curve.

Immediately upon the second inoculation there may occur in a proportion of cases a moderate and purely temporary fall in titre, probably somewhat similar in character to the negative phase of the opsonic index, and passing off within a day or two to be followed by the rapid rise just mentioned. But if a longer period has elapsed (e.g., five months or more) before the heterologous inoculation is given there may be no change of any kind in the agglutination titre, though whenever any change at all does actually occur its main feature is a rise in titre.

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Oxford.

* See THE LANCET, Oct. 9th, 1915, p. 837

AN OUTBREAK OF ANTHRAX CONVEYED BY INFECTED SHAVING BRUSHES.

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THE following examples of anthrax in man are worthy of publication inasmuch as they seem to be the first recorded instances of such a means of contracting the disease. Of the three cases that were definitely proved to be caused by the use of infected brushes, two—referred to later as the D—— and B—— cases respectively—survived the disease, whereas the other (the W—— P—— case) proved fatal. As the fatal case was the one that suggested this mode of contracting anthrax, and also provided other features of interest during life, its details are here described at some length. This paper, then, deals with (1) three cases of anthrax proved indubitably to have arisen after the use of a fully manufactured but still infected article; and (2) the bacteriology of (*a*) certain unused brushes manufactured at the same period, and (*b*) the materials used in their composition. I do not deal with the means adopted to control the distribution of such brushes as could be traced to the infected consignments except to say that, on the facts becoming known, prompt action was taken to secure, so far as possible, their withdrawal.

Clinical Notes of the W—— P—— Case.

The patient was 32 years of age. June 29th: In the evening he noticed what he considered to be a boil coming on the front of his neck. 30th: He woke up to find considerable swelling of his neck. His medical attendant noted a high temperature and much œdema of the neck, but no "pustule" formation. July 1st: He was admitted to the West London Hospital.

Condition on admission.—There was a small yellow patch of subcuticular necrosis over the most prominent part of his thyroid cartilage in the middle line, with about half a dozen vesicles lying on its margin and extensive œdema limited above by the lower jaw, spreading over the clavicle below, and fading gradually towards the middle line behind. The mass was tender on manipulation and non-crepitant. Temperature, 99° F.; pulse-rate, 120.

After a general anæsthetic at 7 P.M. the patient became conscious but remained profoundly collapsed throughout the night, sweating profusely and becoming gradually more cyanosed. The temperature was subnormal, and the pulse-rate 150 and over. Death occurred at 7.30 A.M. on July 2nd, the total duration of illness being 60 hours. No bacteriological examination was made during life.

At the post-mortem examination held six and a half hours later it was seen that the œdema had made considerable headway, extending from the lower face above to the xiphisternal notch below. Laterally the outline of the neck was so deformed that the natural break between head and shoulders was almost obliterated, giving from in front a frog-like appearance. Over the pomum there was a surgical wound half an inch long and one-eighth of an inch broad. Dissection at this spot showed very little if any destruction of tissue apart from the surgical incision. Preliminary punctures withdrew yellow, slightly turbid odourless fluid from the front of the neck and a similar but sanious exudate from the parts affected by hypostasis. Hangdrop and smear preparations made from this fluid showed few leucocytes, but numerous large non-sporing, non-motile, encapsulated bacilli. The same bacillus was subsequently seen to occur in great numbers in smears from the blood, spleen, kidneys, lungs, and exudates. The other appearances noted were an œdematous infiltration of the anterior, middle, and posterior mediastina, with a large serous collection in the left pleural sac; hypostatic congestion of the lungs; staining of the endocardium and the intimal lining of the vessels; dark and mainly fluid blood; heart muscle atonic; peculiar dry, ground glass appearance of the peritoneum, with collapse of the gut; injection of the stomach and intestine, with scattered small hæmorrhagic erosions and a little altered blood in the former; a small but dark-coloured spleen (6 oz.); and no obvious enlargement of the glands. The brain was not examined. Positive cultures possessing the cultural and biological characteristics of B. anthracis were obtained from the spleen, lungs, liver, stomach, and upper intestine, and œdema fluid from the neck, mediastinum, and pleura, but not from the bronchial mucus. There was no urine to examine. Control anaerobic cultures from the neck, blood, and spleen showed no bacterial growth. It was concluded that the bacillus had entered the blood stream through the skin of the neck, as no appearance of a primary lesion in the intestines or the lungs could be discovered.

Clinically this was an example of so-called "erysipelatoid" anthrax, which is characterised by the insignificance or deferred appearance of "pustule" formation, rapidly spreading œdema, and a high mortality. It is usually seen in the neck or eyelids where the tissue is loose and cellular. In such tissue there is probably little power of resistance to invasion and no barrier formed to prevent early bacteriæmia. However, the œdematous infiltration may be marked without death ensuing. There is an example recorded in the Annual Report of the Chief Inspector of Factories for 1908, in which a flesher, who had extensive œdema of the face, upper extremities, trunk, and right thigh, recovered after the use of 90 c.c. of Sclavo's serum in 20 c.c. doses.[1]

An early diagnosis was rendered difficult, partly on account of the type assumed by a disease which is rarely seen in most London hospitals, but chiefly because the man's occupation was one of the last to suggest anthrax. The odds were as much against his having a cellulitis of the neck due to B. anthracis as they would have been in favour of this had he been a brushmaker or hide salter.

Having proved the identity of the bacillus by culture and inoculation, the point of immediate interest to decide was in what manner infection came about. With this object in view, and bearing in mind the protean nature of anthrax purveyance, some of the patient's relatives were rigorously questioned, but with so little success at first that it seemed that this case would have to be relegated to the unsatisfactory group of unproven etiology were it not for an observation made at the post-mortem examination. At that examination it was noted that the small local lesion came well within this individual's shaving area, which covered a larger ground than usual. This suggested the idea that a new shaving brush might have laid a charge which the subsequent passage of a razor exploded. This was thought of not so much because the lesion was on the neck—a site very commonly infected in workers in all the scheduled industries—but because it occurred in the shaving area, and, moreover, in a part supported by the hard thyroid cartilage, where the attrition of the brush might deposit most spores and the razor edge could easily wound. The relatives of the patient were therefore asked to follow up this clue with the result that another member of the family, the actual purchaser and donor of the shaving brush, stated that her son had certainly used the brush she had bought during the fortnight it had been in his possession, but only a few times, as he had not altogether discarded his old one.

At the subsequent inquest a verdict was brought in that death was due to anthracæmia, possibly

[1] In the W—— P—— case specific treatment was not attempted.

contracted from shaving with an infected brush. At this inquiry expert veterinary opinion was opposed to this provisional suggestion. It was held that vegetable fibre rather than animal was usually employed in the making of these cheaper brushes, and that infection from them was therefore improbable. But the three facts—viz., the site of the lesion, the use of a new shaving brush, and the absence of any other discoverable source of infection, together with the one possibility, viz., that the fibre used in that new brush might be of animal origin and infected—were sufficient to suggest a working hypothesis which later investigation proved conclusively. The idea was considered chimerical in certain quarters, probably because it was without actual precedent. In others it seems to have caused annoyance, and it must be confessed that the supposition was put forward with a reserve that would not have been present if the brush had been examined before the inquest.

About a week later the brush was available for examination. Fortunately it had not been washed after the last time of shaving, an important accident, as will be seen later. It was of poor quality (wholesale price 6*d.*). The fibre used was animal with a small leaven of vegetable. The former moiety appeared to be made up of hair of various kinds, some being artificially dyed to resemble badger. After comparison with known samples, it was concluded that pig bristles, horse hair, and possibly cow tail were present, but owing to lack of experience in this intricate differentiation an exact classification could not be formulated. The main point, however, was that animal hair was present in abundance, which showed that the assertion made at the inquest that cheap brushes were mostly composed of vegetable fibre did not apply to this sample. The other constituents were the bone handle and the cementing substance, the latter of which might or might not have been of animal origin. In the bacteriological examination the bone, the cement substance, and the hair were treated separately. Several fragments of cement material obtained as far away as possible from the hair and scrapings from the surface of the bone handle were proved to be free from B. anthracis by cultural methods, and for the moment no more time was spent over their examination.

As regards the examination of the hair a rather ambitious and perhaps over-cautious programme was arranged. It was thought that if a wash made from all of them was inoculated into an animal death might ensue from some infection that would mask anthrax. It was also thought that the infection might be limited to one variety of hair in particular. Therefore about a third of the fibre was removed from the handle. This freed portion, after a prolonged scrutiny, was divided up according to the varieties of hair it was thought were present—i.e., those elements considered to have been derived from pig, horse, or cow were separated into groups and the unrecognised remainder treated as a separate batch. These hairs, as arranged, were then examined (*a*) singly by heating in broth at 90° C. for 30 seconds and laying in parallel rows on surface agar, and (*b*) in groups by washing in broth and plating the centrifuged deposit after heating. Inoculation direct from the washings was not performed in these preliminary experiments, which were fruitless, only one organism being found on the plates which appeared to merit a trial by injection. Rather a long time was wasted over these endeavours to allocate the spores to particular hairs, and in the light of present knowledge the attempts were not worth the labour involved, as the original classification of the hairs was probably inaccurate. Moreover, the fact that the brush had already been wetted during shaving with the likelihood of a universal distribution of the spores was at that time overlooked. But mention is made of the work, as the time spent on it caused delay in the successful attainment of the object aimed at.

Later the rest of the brush was "lathered" in a stone mortar in imitation of the ordinary process occurring in shaving with 20 to 25 c.c. of sterile broth rendered definitely alkaline to phenolphthalein with 5 per cent. sodium hydrate. The collected washings, after heating at 80° C. for 15 minutes, were divided into three portions. One of these was stored for further work if necessary. The second was centrifuged and the deposit collected in 1 c.c. of the supernatant broth. This was thoroughly shaken and distributed in decreasing amounts through three agar plates. Among the many colonies which occurred on these plates three proved to be B. anthracis on subculture and inoculation. The deposit from the remaining third was injected into a young rabbit weighing 1000 grammes. This animal died three days later from typical anthrax, but in order to be correct academically the organism grown from the animal's blood was subcultured and inoculated into a guinea-pig with similar results.

It could now be definitely stated that the shaving brush was infected with anthrax. This infection was probably due to disease in the animals from which the hair used in their manufacture was originally obtained. It might, however, be urged that it was brought about by contact with an abraded anthrax lesion. This point could only be settled by an examination of unused brushes. These brushes, five in number, together with the one bought and used by the patient in the W—— P—— case, comprised a lot of six from the same manufacturer exposed for sale in a druggist's shop. They were dealt with in the same way as the original brush—i.e., by "lathering" in alkaline broth and treating the washes in the manner already described. These washings were invariably very dirty. Great care was exercised in rinsing and sterilising each mortar before treating another brush, as it was thought that otherwise infection might easily be carried through a series of brushes. In the plates importance was only attached to the deep colonies, as described by Professor Eurich in the *Journal of Pathology and Bacteriology*, vol. xvi., 1912.

Results Obtained from the Examination of Brushes.

Brushes.	Result of inoculation into guinea-pig.	Growth on agar plates.
No. 1*	B. anthracis.	A few colonies of B. anthracis.
,, 2†	Negative.	—
,, 3	B. anthracis; also B. perfringens.	Many colonies.
,, 4	B. anthracis; also B. malignant œdema.	Many colonies.
,, 5	B. anthracis.	Not done.
,, 6	B. anthracis.	A few colonies.
,, 1A	B. anthracis; also B. perfringens.	Many colonies.
,, 2A	B. anthracis.	Not done.
,, 3A	B. anthracis; also B. perfringens.	Many colonies.

* Original brush.

† After the first inoculation a further attempt to find the spores of B. anthracis in the wash from this brush was not made.

The foregoing list of results obtained from the examination of two batches of brushes—the first six being those obtained from the druggist's shop—shows the widespread distribution of the spores and how gross the infection was on certain of the brushes. Plates were not made from all the deposits on account of pressure of work.

The animals inoculated survived periods varying from 30 hours to 5 days. Those that died soon—viz., those inoculated from Brushes 3 and 4 and 1A and 3A—did not show the characteristic post-mortem appearances of anthrax, but there was no difficulty in obtaining the bacillus by culture from the blood and spleen. It was also noted that one of the dust organisms occurring on the plates occasionally contaminated B. anthracis in cultures from the blood and spleen, but this organism did not seem to be pathogenic when inoculated by itself.

After the above series was completed, a brush from the same manufacturer, which had been used in the D—— case by a man who had contracted facial anthrax, was tested. It was found on arrival to have been well cleansed, judging by the complete absence of residual soapsuds and particles of beard, much of which still adhered to the brush from the original case. The bacillus was not obtained from the free portions of hair even after repeated trial. This failure may have been due to the fact that all spores had been removed during shaving and when the brush was washed after shaving. To strengthen the supposition that thorough washing would free these brushes from infection, the following tests were applied:—

1. Brushes 3 and 4 and 1 A and 3 A from the above batch were well rinsed in warm water from a running tap. They were then dried and treated in the same way as in their first examination. The centrifuged deposits obtained from the second washes were combined and inoculated into one guinea-pig with negative results. Plates were also made and they showed a very great diminution in the total number of organisms.

2. Some of the "goat hair," mentioned hereafter, was well washed in hot soap and water, and then rinsed in hot running water. After this procedure the deposits obtained from a further washing in a small quantity of alkaline broth failed to infect after inoculation. It might be added that though the washing of hair fixed to a handle did no damage to that hair but apparently freed it from a potential danger, the same process applied to untethered hair resulted in such inextricable confusion that it became useless for brush-making. Moreover, the spores were not destroyed but only displaced by this method.

The brush from the D—— case was at last proved to be infected when the ends of the hair imprisoned in the handle were examined. After freeing them from the cement substance, as much care as possible being used, it was noted that they were markedly damaged by heat. However, the animal inoculated with the greater part (three-quarters) of the deposit from their washings, after heating at 80° C. for ten minutes, died eight days later from anthrax. On the other hand, a plate made from the remaining quarter of the deposit did not show a single organism of any kind.

The next material to be examined were samples of Chinese "goat hair" and hog bristles, which were said to have been mixed and used in the composition of these brushes. A sample of dust from the wooden bin in which the bundles of "goat hair" were stored was also collected at the same time. Of these, the hog bristles were well bleached and clean in appearance. Anthrax spores were neither found in them nor in the dust—almost negligible in amount—that had been scraped from the bin. The "goat hair" was dirty, and washings from it gave a muddy deposit.

A variety of animals seem to have contributed a share in the constitution of these bundles of "goat hair." Occasionally vegetable fibres were found.

Plates made from the washings and grown aerobically teemed with colonies, about half of which were those of B. anthracis. The animal inoculated died in 30 hours from emphysematous gangrene caused by a very mixed infection, but cultures from the spleen and blood gave a few anthrax colonies. Before these were secured a piece of the agar plate containing two colonies of anthrax was broken up and injected into a second pig, which succumbed in three days and showed anthrax only. It is remarkable that no cases of anthrax occurred amongst the hands employed in the factory.

With a view to an explanation of the occurrence of so large a number of spores in the materials worked with, tests were now done to detect the presence of blood and protein on these hairs and in the washings obtained from them. But neither was found in amounts sufficient to assume soiling with animal tissues or discharges. The benzidin test gave an indefinite reaction, which was not confirmed by the other "occult blood" tests. Protein bodies could also be considered absent from a practical point of view.

The following observation, though very insufficiently worked out, may be mentioned as throwing perhaps a little light on hair infection.

About 30 pediculi found in a guinea-pig dead from anthrax were planted out on to the surface of agar plates, without any preliminary heating to destroy other organisms. Two gave rise to colonies of anthrax, which appeared first about the anal regions of the pediculi. (Of these two colonies, one was confirmed by inoculation and the other identified by culture only.) But one or two attempts to prove that hairs cut off from parts of the same guinea-pig well away from the external orifices were infected were made without success.

The finding of the two anthrax carriers might have been due to good fortune, and many more parasites might have been examined without discovering further infection. If allowance is made for the greater size of the parasites preying on larger animals, the greater is the possibility of the hairs of these animals becoming infected by the excretions of such parasites.

These and other experiments with the flies living in the animal room were not pursued further owing to exigency of time and the change of season. It is probable that animal inoculation would be a better means of detecting infection in such insects than a plating-out method, which was alone used in the few experiments carried out.

The last two brushes to be investigated were associated with a case that occurred in B——. The patient was a young adult, aged 20, who developed a malignant pustule on the back of the neck. These two brushes were even of a commoner kind than the ones previously spoken of. The wholesale price was 3*d*. This youth had bought his brush about six weeks before his illness, but his age suggests that he did not have to use it often during that time. The second brush was obtained to serve as a control from the stores at which the first had

been bought. It was of the same pattern. The results of the examination were as follows:—

Brush.	—	Guinea-pig.	Plates.
No. 1.	Used.	B. anthracis. Guinea-pig died on sixth day.	Not made.
No. 2.	Unused.	Died from emphysematous gangrene.	Not made.

These results were not in accordance with anticipation. It was thought that as the lesion was on the back of the neck the shaving brush would probably be found blameless. So it must be concluded that infection was caused by the fingers or a face-cloth, either of which might readily become infected.

Interest attaches to the result obtained by another bacteriologist, which showed the presence of anthrax infection in a sample of the material said to have been used in the manufacture of the brush in question.

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THE DIAGNOSIS OF SO-CALLED PRIMARY TUBERCULOUS MENINGITIS.

RETENTION OF URINE IN THE ADULT MALE, WITHOUT ANY APPARENT CAUSE, AS A NEW PATHOGNOMONIC SIGN.[1]

BY D. W. KEILLER MOODY, M.D. ABERD.,
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TUBERCULOUS meningitis in a child is a disease which can generally be easily diagnosed, but in the adult, unless there is distinct evidence of tuberculous disease elsewhere, it is very difficult, and in many cases impossible, to do so. Comparatively recently I have come across four cases of this disease in the adult (male) in which there was retention of urine without any apparent cause, and I have in consequence come to look upon it as a pathognomonic sign. The act of urination is a voluntary one, a sensory stimulus is sent from the bladder to the brain, which is possibly a sensation of distension of the bladder. The response to this is a voluntary act—contraction of the abdominal muscles. This presses a few drops of urine into the sensory neck of the bladder which gives rise to the spinal reflex which produces contraction of the bladder walls with inhibition of the sphincter at the neck of the bladder, and so urination. In the cases I have written on there was no paralysis of the abdominal muscles and no pain or desire to micturate. Evidently sensation was absent, but why I cannot explain.

CASE 1.—Male, aged 20 years, shop assistant. Had not been feeling fit for some time; fairly well nourished; complained of headache. No sickness. Temperature 101° F.; pulse rapid; tongue dry; no cough. No cyanosis; flushed appearance. Respirations normal. Bowels constipated. Heart, both sounds present; no adventitious sounds. Lungs normal. No enlargement of spleen or liver. Urine, specific gravity 1020, straw-coloured, acid; no albumin or sugar. Bowels moved by enema; yellowish, no blood. During next five days temperature was irregular, being normal in the morning and varying in the evening from 101° to 102·6°. On the morning of the sixth day he told me he had not passed urine since the day before. The bladder was distended. I used a rubber Jacques catheter; it entered quite easily. Urine tested again; normal. No paralysis of abdominal muscles. I could not come to a diagnosis, so called in a second opinion; still no diagnosis. He gradually became worse. Pulse became irregular and slow. Respirations more frequent. Pupils dilated and irregular. Gradually sank into a semi-conscious condition. Coma developed later and he died on the tenth day. Towards the end the temperature became normal. I had to draw off urine every day until he died.

Necropsy.—A post-mortem examination was performed (at which a pathologist was present). Brain: Matting together of the membranes; effusion of lymph, which was opaque, round base of the brain, especially round the optic chiasma and in Sylvian fissures; several whitish nodules on various parts of the brain, very few and very difficult to find. There were no tubercles mixed with lymph. Miliary tubercles were found in various organs, liver, kidneys, &c. Otherwise all the organs normal. The prostate was not enlarged. Death was due to tuberculous meningitis, secondary to acute miliary tuberculosis.

What struck me most about this case was that the patient was unable to pass urine. He had no pain although the bladder was distended and he had no desire to pass urine. There was no stricture or enlarged prostate. He simply mentioned the fact that he had not urinated, as it struck him as being "rather funny." Evidently sensation was quite absent and there was no paralysis of abdominal muscles.

CASE 2.—A male, labourer, aged 35 years, who had been, to all accounts, in good health previously, was suddenly taken ill one evening. I saw him the next morning; he was then in a comatose condition. Very cyanosed; temperature normal; tongue dry. Pupils widely dilated and irregular. Pulse slow, feeble, and irregular. Heart, both sounds present; no adventitious sounds. Lungs normal. Liver and spleen not enlarged. Bladder, dull note nearly up to umbilicus; passed Jacques rubber catheter quite easily. The urine was of specific gravity 1015, cloudy, acid, no albumin or sugar. Typical Cheyne-Stokes breathing. Incontinence of fæces. He died the same evening. The temperature was still normal.

Necropsy.—At the post-mortem examination there was matting together of membranes of the brain and a large quantity of turbid lymph mixed with tubercle at the base surrounding the nerves and extending into the Sylvian fissure. There was a large patch on the anterior portion of the convex surface of the cerebrum. The ventricles were full of fluid; other organs in the body were normal. The prostate was not enlarged. Death was due to tuberculous meningitis. I could not find any primary cause, although there was probably a caseous gland somewhere. When I discovered that the bladder was full I at once thought of Case 1, and that this also might be another case of so-called primary tuberculous meningitis, and so it proved.

CASE 3.—The patient, a male aged 31 years, whom I saw in the evening, had been "seedy" for some time, and was now in a drowsy condition. He understood what I said to him, but before I could get a reply to my question he would relapse into the same drowsy state. The temperature was normal and the pulse slow, feeble, and irregular. The patient's mouth was full of blood, evidently from biting his tongue; nothing in the throat; very cyanosed; dyspnœa. Both heart sounds were present; no murmurs. The lungs were normal; there was slight cough, but no sputum. Liver and spleen, dullness normal. The bladder was distended; a Jacques rubber catheter passed easily. Urine: Specific gravity 1010, cloudy, alkaline, no albumin or sugar. There was a large quantity of earthy phosphates which probably accounted for the alkalinity. No paralysis of the abdominal muscles. The patient being constipated, an enema was given; the stools were quite black, probably due to blood swallowed. Kernig's sign was present, also tache cérébrale. He rapidly became worse; the respirations increased and the pupils were widely dilated and irregular. He sank into a deep coma and died the following evening.

Necropsy.—At the post-mortem examination the brain showed all signs of tuberculous meningitis. Both kidneys were cystic and weighed 2½ and 2¾ oz. respectively. The prostate was not enlarged; other organs normal. I could not find any primary cause, but I did not search very minutely. After the experience of the first two cases, the moment I found the bladder full I felt perfectly certain in my own mind as to the diagnosis and what I should find post mortem, and the result proved my expectation to be correct.

[1] Published by permission of the Medical Director-General, Royal Navy.

The following case tends to confirm the observations recorded in the first three cases:—

CASE 4.—The patient was a male aged 47 years. When I first saw him he was in a very weak condition suffering from advanced tuberculous disease of both lungs. The pulse was irregular and slow. He was very cyanosed and was constipated. On the third morning the nurse informed me that he had not passed urine. The bladder was distended; I passed a Jacques rubber catheter quite easily. The urine was high coloured, of specific gravity 1025, acid, with no albumin or sugar. There was no paralysis of the abdominal muscles and no enlarged prostate. Kernig's sign was present, also tache cérébrale. That evening he had a more or less typical Jacksonian fit. These fits continued with intervals until he died the following evening. Respirations increased; temperature normal every morning. The first day I saw him his evening temperature was 99° F. On the following evening it was 99·2°, on the next evening 100°, and on the night on which he died 103·6°. His death was due to tuberculous meningitis, secondary to tuberculous disease of the lungs.

Necropsy.—I only examined the brain and found the usual tuberculous signs which one would expect.

Case 4 is especially interesting, as there was ample evidence of tuberculous disease elsewhere, and therefore no doubt about the diagnosis. The retention of urine was present without any cause, and the patient himself did not mention the fact that he had not urinated and seemed to have no pain or discomfort in consequence. The diagnosis can nearly always be clinched by lumbar puncture, but this is a procedure which is often inadvisable or inexpedient.

The laity always want to know what is wrong with the patient, but they do not always appreciate the difficulties that beset the physician's path. I hope, therefore, that this sign of retention of urine, which, I think, one is justified in calling "pathognomonic," will help in forming a diagnosis in those difficult cases of so-called primary tuberculous meningitis. I have searched the literature on the subject, but I have not read of this sign being quoted before. It would be interesting to hear what the leading physicians have to say.

A FATAL CASE OF "DOPE POISONING."

BY W. E. LEE, M.D. LOND., F.R.C.S. ENG.

CASES of "dope poisoning" are so recent in origin and so few in number that it is desirable to make the record of each one as complete as possible. The one here recorded is the fifth fatal case, and occurred at a large aeroplane works at Kingston.

The patient, a male aged 60, a "tapist," went to Mr. Isaac Coalbank, of Teddington, on Nov. 19th, 1915, complaining of diarrhœa, vomiting, and weakness, which was so great that he could hardly walk a distance of less than half a mile to the surgery. He was sent to bed, and stayed there until his death on Dec. 2nd. The diarrhœa continued, the vomiting altered in character, becoming less frequent, and a very much larger amount coming up at each time. Jaundice came on three days later—i.e., on Nov. 22nd—it became more intense and continued throughout the illness. Petechial hæmorrhages appeared and increased in number until the body was covered almost as with a measles rash. He became somnolent, and this deepened into coma, in which he died.

Necropsy.—A post-mortem examination was made on Dec. 3rd by Mr. R. A. Clarke, of Teddington, at which Dr. T. M. Legge, of the Home Office, Mr. Coalbank, Mr. H. Davidson, Dr. E. G. Gibbs-Smith, medical officer of health of the district, and myself were present. Externally the body was well nourished, with ample subcutaneous fat. There was general jaundice of moderate intensity, slightly paler on the legs than elsewhere. On opening the abdomen the liver was not seen until the overlying stomach and intestine had been lifted up. There was a large amount of free bile-stained fluid. The gall-bladder was large, had many adhesions round it, but contained no gall-stones, and none were found in the ducts. The liver weighed 39 oz.; its surface was wrinkled and it lost its shape when laid on the table. The capsule was obviously too large for the contents. The right lobe was almost normal in size and the left very small. The right lobe was stained a bluish-green colour, quite unlike that seen in post-mortem decomposition. The left lobe was bright yellow. On section very little blood escaped; it was hard to cut, firm to the touch, and the lobules very prominent. The kidneys were large, the capsule stripped readily, the cortex was very narrow, and the pyramids were swollen. The spleen was shrunken, congested, and friable. The heart weighed 15 oz.; the whole endocardium was smooth, deeply stained a dark-red tint in uneven patches. The heart muscle was similarly stained for a quarter of an inch below the endocardium and friable. The stomach and intestines were normal. The lungs showed some emphysema. The aorta was stained in a similar way to the heart.

Past history.—The patient had been in the Royal Navy for many years, taking part in the West African and other expeditions. He had then been a painter until Oct. 23rd, 1915, when he started work in an aeroplane factory.

The following points are of interest. The taping room where the man worked is not regarded as being so dangerous as the painting room, where the whole fabric is painted with "dope" in six coats, 24 hours being allowed to elapse between each coating. Taping is putting on strips of fabric 2 inches wide over the fabric seams after dipping them in "dope." There is a good deal of vapour in the taping room, but not so much as in the painting room.

The composition of the "dope" is important; it consists of acetate of cellulose or celluloid dissolved in tetrachlorethane, with amyl alcohol and benzene.

The treatment of the case was tartrates, citrates, and alkalies, with saline injections, plenty of water to drink, and stomach lavage.

"Dope poisoning" is a new disease. The first case occurred in November, 1914, and there have been three other fatal cases besides the one reported here. A very full account of the first outbreak was published in THE LANCET of March 13th, 1915, by Dr. W. H. Willcox, with an account of the microscopical appearance of the tissues. The small size of the left lobe of the liver has been noted in other cases and seems to be characteristic of the disease. An outbreak occurred in February, when several girls were the subjects; fortunately they all recovered. The first fatal case was in a male, the next three in women, and the one now recorded in a male. The average age of the fatal cases is much greater than the average age of the cases which have recovered. The disease is now a notifiable industrial disease under the Disease Section of the Workmen's Compensation Act.

An action was brought by the widow of the first victim claiming that her husband had died as the result of an accident. This was decided against her, and the Aircraft Company paid her a sum of £150 on condition that she did not appeal against the decision.

In conclusion, I have to express my hearty thanks to Mr. Coalbank for his kindness in supplying me with the clinical history of the case and allowing me to publish it.

Finsbury Pavement, E.C.

AN INTERRUPTED HAMMOCK-BED IN THE TREATMENT OF COMPOUND FRACTURES OF THE HIP AND THIGH.

BY C. W. G. BRYAN, F.R.C.S. ENG.,
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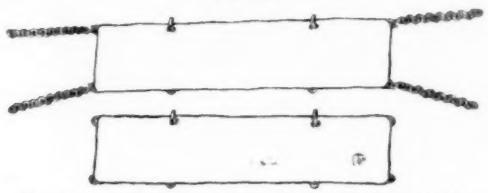
IN the treatment of septic gunshot wounds, especially where bones and joints are involved, it is recognised that two principles are of the greatest importance—namely, frequent change of dressings and immobilisation. Immobilisation is necessary, not only to avoid pain and consequent exhaustion, but also to prevent auto-inoculation from disturbance of the septic area. Unfortunately, the more often a wound is dressed the more it is apt to be disturbed.

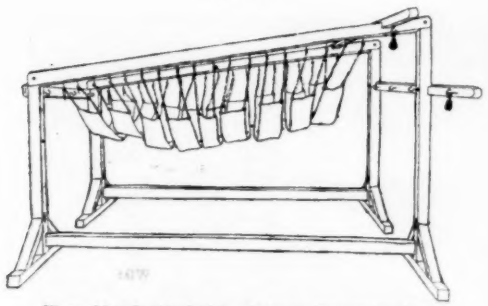
FIG. 1.



Four-fold flannel bands, with rings at the corners and hooks and eyes at the sides.

For the treatment of compound fractures of the upper extremity much ingenuity in devising splints has been displayed successfully, and forms of apparatus are available to enable nearly every type of wound to be dressed without disturbance. In the lower limb, however, dressing without altering the position of the patient or his fracture may be a matter of very great difficulty, and especially is this the case when the hip-joint or the upper end of one or both femurs is injured. In these cases also there is usually a wound situated posteriorly, whether due to the projectile or to an operation for counter-drainage.

FIG. 2.



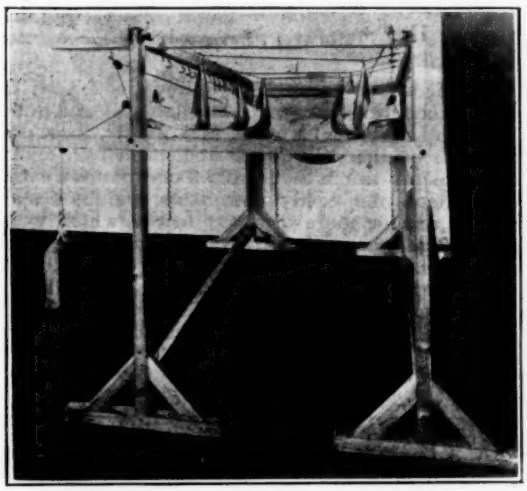
Flannel bands attached by chains to the wooden frame.

Again, the care of the patient's back, a particularly serious matter in these cases owing to wasting and the profuse discharge from the wound, and the other necessary manipulations of nursing lead to frequent disturbance of the patient. In many cases he can lift his own body off the bed by pulling with his arms, but this leads to an objectionable waste of strength when he is weak and toxæmic.

Recently having to treat two patients with severely septic compound fractures of the femur involving the hip-joint, one of the wounds in each case being very large and placed posteriorly, I was led to devise a simple interrupted hammock-bed in which the patient can lie practically undisturbed while all the processes of dressing and nursing are carried on.

The bed is made with two ordinary Balkan splints which are united by three transverse cross-pieces of wood so that their inner borders are 36 inches apart. One cross-piece is screwed to the head-end vertical bars of the splints 40 inches from the ground; the second one is bolted to the foot-end vertical bars of the splints, also 40 inches from the ground; and the third cross-piece is bolted to the two overhead bars of the splints 12 inches from their foot-ends. The second and third transverse bars are prolonged beyond the Balkan splint on one side for 18 inches, so that full abduction by weight extension, which is usually necessary for fractures in the neighbourhood of the hip, can be obtained. The fact that these bars are attached by bolts enables them to be reversed when necessary. To the under aspect of the upper bars of the Balkan splints strong hooks are screwed at intervals of 4 inches. To each of these hooks a piece of chain 10 inches long is attached.

FIG. 3.



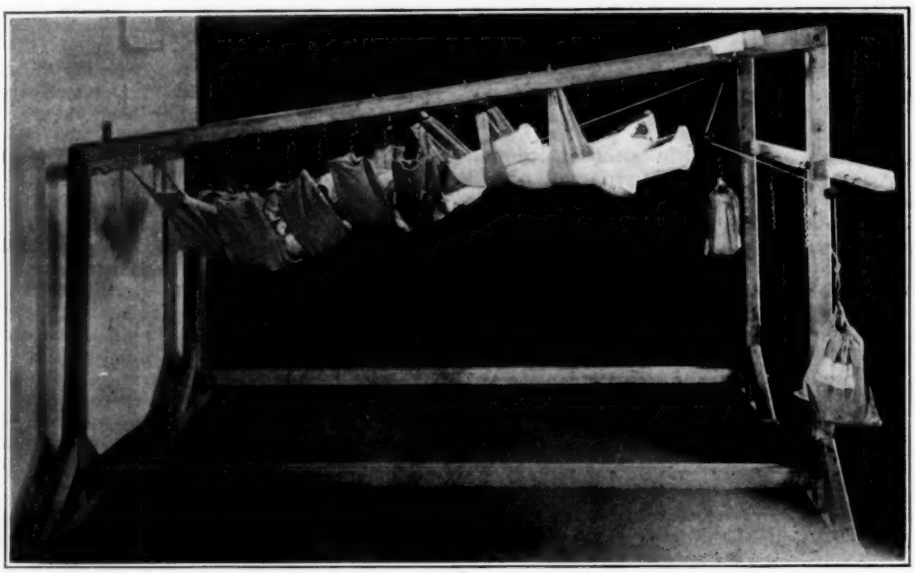
End view of bed in use by a patient with septic compound fracture of neck of right femur, suppurative arthritis of right hip, and septic compound fracture of shaft of left femur.

The bed on which the patient lies consists of transverse bands of flannel. Each band is made of four thicknesses of flannel, 36 inches long and 8 inches wide, and has sewn in each corner a small curtain-ring, while to each edge, 9 inches from the end, large hooks and eyes are sewn. (Fig. 1.)

Each corner of the flannel bands is hooked to the end of one of the chains mentioned above, and each band is attached to its neighbours by the hooks and eyes. When the patient is in the bed the bands are adjusted so as to distribute his weight evenly by hooking the chains to the Balkan splints at a convenient link. In some cases it is desirable to make the bands which are in contact with the dressings of rubber sheeting instead of flannel. (Fig. 2.)

To immobilise the fractured limb I use two stirrups of strapping, one attached to the thigh, the other to the leg. From the upper stirrup a cord

FIG. 4.



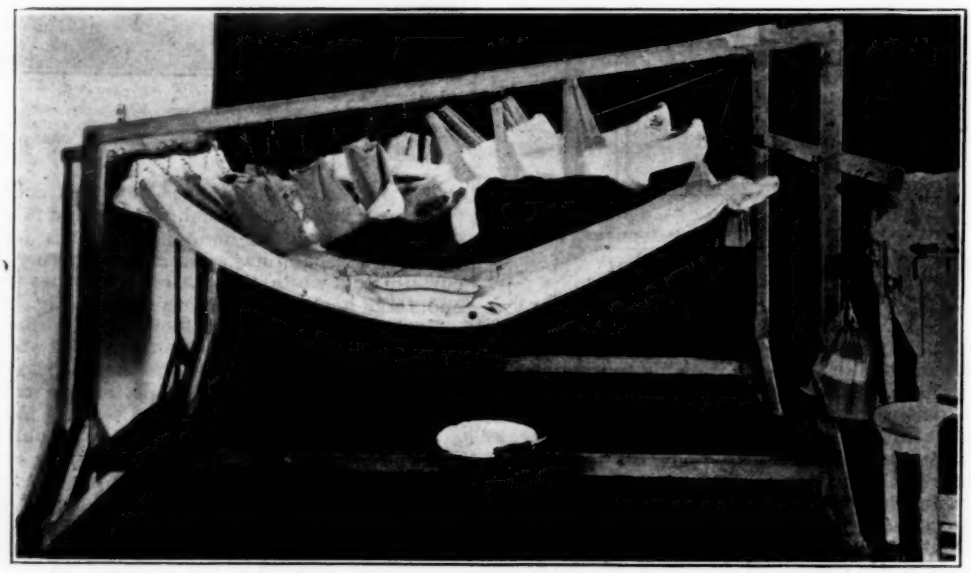
Side view showing abduction extension cord and pulleys attached to projecting limbs of cross-bars.

is carried first through a pulley hooked on the upper abduction bar, then through a second pulley fixed to the lower stirrup, and finally through a pulley hooked to the lower abduction bar, ending in a weight which is usually 2 or 4 pounds. As a convenient and easily obtainable weight I make use of one or more ordinary bricks, which weigh about 2 pounds each; every brick is enclosed in a bag, which is hooked by a metal S to a loop at the end of the cord. (Figs. 3 and 4).

To keep the back of the patient warm a blanket is doubled lengthwise and has strong hooks sewn at the corners, at the middle of each end, and at intervals of 12 inches at the sides. This blanket is attached by its ends to three hooks screwed into the transverse bars at the head and foot of the bed, and its sides are hooked to the side chains to keep it in contact with the patient's body. As many more blankets as are necessary are folded and placed on the top of the first one, six layers sufficing as a rule.

When the wound is dressed the sides of the blanket are unhooked and its lower end is detached and hooked to 9-inch lengths of chain passing

FIG. 5.



Wounds exposed for dressing without disturbance of patient.

from it to the hooks on the lower cross-bar, thus increasing its length (Fig. 5); it now lies suspended several inches below the patient and is used to support a sterile towel, kidney-dish, &c. Whichever transverse band lies behind the wound is then unhooked from the frame and from its neighbours, so as to expose the dressing. In this way the dressing is carried out easily with an extremely slight amount of disturbance of the patient. Similar manœuvres are necessary for nursing purposes, the lowered blanket being used to support nursing utensils.

Where a continuous irrigation is being used it can easily be adjusted by slitting one transverse band longitudinally for half its length, so as to expose the posterior wound or wounds.

An advantage of the hammock-bed consists in the fact that the whole frame can be moved without any disturbance of the patient; moving the bed of a patient whose limb is slung from a Balkan splint in the ordinary way is a laborious and painful process. Any tendency for the patient to slip towards the foot of the bed is overcome by lowering his shoulders and raising his pelvis, the length of the chains being adjusted at suitable places.

The hammock-bed which I have described is cheap, taking the place of an ordinary bedstead and rendering mattress, water-bed, and air-pillow unnecessary. It also economises time and labour, as nursing and dressing can be carried out more speedily and with less help than is usual with the forms of bed and splint ordinarily employed.

I wish to express my thanks to Lieutenant C. H. Hopwood, R.A.M.C., for the photographs with which this description is illustrated, and to the nursing sisters who have given me much valuable help.

British Expeditionary Force, France.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

Treatment of Dysentery.

A MEETING of this society was held on Dec. 20th, 1915, Dr. FREDERICK TAYLOR, the President, being in the chair.

The PRESIDENT, in introducing Sir Ronald Ross, said that dysentery was a disease which had done almost as much damage as anything in this war. Happily, as he understood, there had not been very many cases of it in France and the northern area of fighting generally, but at the Dardanelles and in other parts of Europe, as well as in parts of Asia, there had been a great deal of the disease. Sir Ronald Ross, who had been in Alexandria and had seen a great deal of the disease, did not undertake to lay down the law on the subject, but hoped to hear criticisms and views from those who had been engaged in treating cases of the disease which had been brought home to this country.

Sir RONALD ROSS then delivered a lecture on the Treatment of Dysentery, which appears at length on another page.

Dr. C. M. WENYON said that for the past two months he had been engaged in examining patients returned from the Gallipoli region by reason of having suffered from dysentery, and he had made 1500 examinations in 500 cases. Many of the cases had already been treated with emetine in Gallipoli. He found that from 60 to 70 per cent. of the returned men had some kind of protozoal infection, and it was very important to decide what form they were suffering from, as this was a necessary prelude to successful treatment. He referred to his recent contributions to THE LANCET [1] on the subject. The commonest protozoal infection found in these men was that of the entamœba coli, which he believed to be a perfectly harmless parasite. The cause of amœbic dysentery was the entamœba histolytica. 50 per cent. of the cases he saw were those of entamœba coli, while 10 per cent. of the cases were harbouring the histolytica, and hence must be regarded as dysentery carriers; they were dangerous to themselves and those with whom they came into contact. The actual amœba could not always be found in the stools, but careful search revealed the encysted forms. The importance of the latter was not recognised by all; it was believed that in order to establish the diagnosis the free live organisms must be demonstrated. The finding of the encysted entamœba was as clear a proof of dysentery as the finding of ankylostoma eggs was evidence of the existence of ankylostomiasis. After a four years' study of protozoa which inhabit the human intestine he was able to say that entamœba coli always ran a true course—there was no transmutation; and a person might carry for years without manifesting dysenteric symptoms the amœba of dysentery. He had injected it from such people into cats and produced in the latter the typical disease. He had also, by transferring it from animal to animal, caused dysenteric abscess of the liver. Cases had already occurred in people who had never been out of this country. He had seen a man recently who was working at the London docks. The patient developed liver abscesses and died from the disease, and the necropsy showed the typical cysts of entamœba histolytica. The ulcers in the large intestine were not very evident, as they were not more than one-third of an inch in diameter. It was doubtless through these ulcers that the organisms found their way to the liver. Dr. Wenyon advocated the careful isolation of carriers and their continuous treatment with emetine, even in the absence of symptoms, because of the danger of their being the means of infecting the community.

Dr. W. J. PENFOLD spoke of his experience in examining the stools of convalescing dysentery patients in King George's Hospital. 103 cases were examined, and 47·5 per cent. of these gave evidence of previous bacillary dysentery. A proper classification of the cases spoken of had not yet been completed. All the cases were from the Mediterranean, and the bulk of them became infected in August and September.

Dr. J. W. CROPPER said that for some years he had been examining free living amœbæ of the non-pathogenic type. The jelly method of Dr. H. C. Ross had been employed, and an effort had been made to ascertain why amœbæ encysted, and why, subsequently, they came out of their cysts. The conclusion arrived at by his co-worker, Mr. A. H. Drew, and himself was that the behaviour of the amœbæ was greatly influenced by the bacteria with which they were associated. He thought the different substances used in treatment acted as intestinal antiseptics, causing the amœbæ to encyst, and so leaving less of them free to produce symptoms.

Dr. A. NEWSHOLME, C.B., spoke of the great value which Sir Ronald Ross's lecture would be to the practitioners throughout the country, especially those medical men who were seeing patients returned from the Eastern theatre. He was specially interested in the preventive side, and had been much impressed by the estimate that about one-seventh of the cases of dysentery might develop liver abscess. That led him to emphasise the value of Sir Ronald Ross's advice to push emetine for all the worth it possessed. The happy immunity of England from dysentery before the war, except in asylums, seemed unlikely to be continued, and he would therefore like to hear whether there were any effective means of preventing the serious possibilities from becoming realities. He concluded by proposing a hearty vote of thanks to Sir Ronald Ross for his paper.

Dr. F. J. WETHERED seconded the resolution of thanks, and stated that he had seen a large number of Australian officers who had come from the Dardanelles after having suffered from dysentery. Some were from the Medical Corps, and he questioned them as to the results of the administration of emetine. The answers varied, but the majority seemed to greatly favour it. He asked whether the means of spread of dysentery was a composite one; was it chiefly fly-borne, or was it due to diet?

Dr BRADSHAW expressed his disappointment that neither the paper nor the discussion, so far, had dealt with chronic dysentery, because that was the stage of most of the cases in the base hospitals in this country They came

[1] THE LANCET, vol. ii., 1915, pp. 1173, 1296, 1404.

with the history of having suffered from dysentery, but otherwise they simply seemed to be subjects of chronic diarrhœa of an intractable kind. The anxiety concerning these cases had been increased since the receipt of the War Office instructions that no cases of dysentery were to be discharged from hospital or transferred to another hospital until three negative bacteriological reports had been received concerning them, spread over a period of a month. In the South African War he had cases of dysentery which got well on massive doses of ipecacuanha, and no liver abscesses supervened later. He was anxious to know what was the best treatment for chronic cases which hung fire, the patients not being particularly ill. His own favourite method of treatment was by means of castor oil; and he narrated the origin of the use of the oil in dysentery, by missionaries in Barbados, and the references to castor oil at that time did not mention its purgative properties, but simply that it was the best treatment for dysentery. He had had very good results from that treatment.

Dr J. P. S. DUNN urged that dysentery patients should not be frequently changed from one doctor to another. In some hospitals a doctor who had had experience of dysentery had no cases of that disease under him; they were being dealt with by those who had had no previous experience of it. It was also most important that at least one doctor on each hospital ship should have had that experience, though he knew, from his work in the South African War, how difficult it was to treat men as well on board ship as on shore. And he thought improvement was possible in the direction of giving the patients more complete rest. When men were convalescing from dysentery they should not be allowed to get up and go to the lavatory; he believed that custom was responsible for many relapses With regard to diet, he starved his patients for the first few hours, giving only water, with perhaps a little brandy. If rapid improvement set in he gave very small meals—egg and a little rusk; this called the masticatory muscles into action, and only the powdered food passed into the stomach. Liquid paraffin given carefully and hot applications to the abdomen were important in acute cases, and absolute rest should be ensured. He would like to know that an official warning had been issued to the profession in the Empire as to the likelihood of many cases of liver abscess occurring, and advising medical men to be on the look-out for them, at the same time pointing out the importance of giving doses of emetine.

Professor W. J. R. SIMPSON mentioned that Mr. Eccles, in the Bombay Presidency, treated 22 cases of dysentery with emetine and morphia in 1869 with very satisfactory results. But he thought it should be used with care. Enteritis had been produced in dogs by large doses of emetine; it seemed also to cause an affection of the nervous system and collapse. Small continuous doses of it caused enteritis.

Dr. MURRAY LESLIE asked whether liver abscess was more likely to supervene in cases of dysentery which showed jaundice He also spoke highly of the value of liquid paraffin in the disease.

The PRESIDENT pointed out, as a matter of historical interest, that Sir William Gull's treatment of dysentery consisted of 5 grains of ipecacuanha three times a day, rest and warmth. There was a time when emetine was extracted from ipecacuanha because it was the active principle responsible for the vomiting, and it was not surprising that the de-emetinised drug was a failure. In the cases of dysentery seen at the Greenwich Seamen's Hospital no organisms were found; they were treated with astringent methods and got well.

The resolution of thanks to Sir Ronald Ross was put and carried with acclamation.

Sir RONALD ROSS, in reply, said he regarded cases such as those mentioned by Dr. Bradshaw as old cases; the chronic cases would be seen in from five to ten years. Some of the questions raised would, he hoped, be settled by the workers at Dr. A. R. Ferguson's central laboratory, Alexandria. He was unable to say how the spread of dysentery could be prevented. The bacteria were found plentifully in the sand and among the catacombs—indeed, it was known in Egypt as "sand dysentery." There was a real danger of acquiring the disease at the latrines, and it was possible to convey it by means of the enema syringe. Some of the points raised, especially by Dr. Dunn, would receive attention in the proper quarters.

SECTION OF DERMATOLOGY.

Exhibition of Cases.

A MEETING of this section was held on Dec. 16th, 1915, Dr. J. H. STOWERS, the President, being in the chair.

The following cases were shown and discussed:—

Dr. GRAHAM LITTLE: 1. Granuloma Annulare of one year's standing in a man, aged about 30, who also presented an exaggerated follicular eruption on the lower extremities. The questions raised were whether the follicular eruption had any connexion with the granuloma annulare, and whether both pointed to tuberculous disease, although no evidence of the latter had been discovered.—The PRESIDENT and other members were of the impression that the follicles were not more prominent than they often are naturally.—2. ? Lichen Planus. The patient had scattered lesions about the body, with a well-marked serpiginous lesion on one foot. As Dr. Little remarked, the histological examination did not support the tentative diagnosis held. The Wassermann reaction was negative.—The PRESIDENT, Dr. J. J. PRINGLE, Dr. H. G. ADAMSON, and Dr. A. EDDOWES considered the case to be of tuberculous origin.

Dr KNOWSLEY SIBLEY: A case for diagnosis. The patient, a man, had had for some years polymorphic skin lesions, which commenced on the knuckles, presumably as angio-keratomata. Elsewhere on the body were verrucose and ulcerative lesions, which on healing left very marked scars. The Wassermann reaction was negative and the von Pirquet test uncertain.—Dr. R. M. TRAVERS-SMITH considered it to be a case of angio-neurosis.—Dr. J. H. SEQUEIRA was of the opinion that it was a tuberculous manifestation, due to the presence of circulating tuberculous toxins.—Dr. ADAMSON was in favour of dermatitis artefacta.—Dr. A. M. H. GRAY thought that it was a case of persistent dermatitis of unknown cause.—Most of the other members regarded it as a tuberculous affection.

Dr. SEQUEIRA: Myxœdema with Sclerodermia. The patient, a woman aged 56, first came under observation 15 years ago, suffering from myxœdema. Under continuous treatment with thyroid extract (gr. i. ter omn. d.) the myxœdema disappeared, but two years ago sclerodermia appeared and affected the lower third of both legs. The chief interest of the case was that the latter condition had appeared in spite of the thyroid treatment, thyroid being a drug which is largely advocated for sclerodermia.

Dr. GRAY (for Mr. WILFRED TROTTER): A case of Recurring Herpes on the right side of the face, since one year of age, in a girl aged 11. The attacks recurred every two or three months, and were always preceded by fever and malaise.—Opinions were divided as to whether there was also present a true facial hemiatrophy or merely contraction of the diffused scar tissue, and also as to whether the condition was of central or peripheral origin—in other words, whether it was a case of recurring herpes zoster or herpes febrilis.—Dr. SEQUEIRA had a somewhat similar case in which removal of the tonsils and adenoids had cured the condition, and other members cited instances in which removal of bad teeth, wax from the ears, and correction of astigmatism had caused the attacks to cease.

Dr. G. PERNET: Acute Involvement of the Soles in a case of Morphœa and Sclerodermia.

Dr. KNOWSLEY SIBLEY: A case of Actinomycosis.

Dr. EDDOWES: A microscopic section, which members generally considered to be of a nævoid character—probably a mole.

ULSTER MEDICAL SOCIETY.

Some Experiences of War Surgery.

A MEETING of this society was held on Dec. 21st, 1915, Dr. A. G. ROBB, the President, being in the chair.

Colonel ANDREW FULLERTON, A.M.S., one of the consulting surgeons to the British Expeditionary Force, delivered an address on the work of the medical officers of the army from his experiences at one of our large bases. He explained that the administrative work in the hospitals and clearing

stations was largely done by the officers of the Royal Army Medical Corps, the surgical consultants and specialists being temporary officers selected from the staffs of the civilian hospitals. It would be readily understood, he said, that every day there were cases in which a second opinion was necessary, and the system of consultants in his area had worked with the utmost smoothness. The more competent the surgeon the more desirous he was of talking over his difficult and dangerous cases with the consultant, and the public could be satisfied that everything was being done for the wounded soldier. Cases were constantly arising in which it was desirable that the consultant should himself operate, when every facility was placed at his disposal. The consultant was, in fact, responsible for all the surgical work done in his district, and in his experience he was usually fortunate in the officers over whom he had supervision. He paid a high tribute to the organisation of the Royal Army Medical Corps, saying that nothing could exceed the smooth working and efficiency of the machinery which transferred the wounded soldier from the trenches to the base or the hospital ship, as the wounded soldiers constantly testified. He then detailed some general lessons of the surgery of the war. Sepsis in brain surgery—as, indeed, in all branches of war surgery—was, he said, the bugbear of the surgeon, and required even more attention than operation. Deep searching for foreign bodies in the brain was to be discouraged, and a bullet that was causing no symptoms should be left alone if not easily accessible. Persistent hernia cerebri was best treated by lumbar puncture or decompression operations. If the patella were shattered it ought to be removed. If the lower end of the femur or the upper end of the tibia were badly comminuted it was probably better to amputate at once above the knee. The question of the removal of foreign bodies from the knee-joint was a difficult one. Rough particles like shell- and bullet-casing have probably carried in bits of soiled clothing with micro-organisms and are better removed, but each case must be considered on its merits, and the judgment and experience of the surgeon will often be taxed as to the proper procedure. Swollen septic knee-joints, with no fracture and no retained foreign body, offer problems requiring abundant experience, and he made it a point to see every available case and watch its progress. He had come to the conclusion that indiscriminate draining of knee-joints with tubes was a mistake. Fixation, excision of the wound, aspiration, and washing out with saline; aspiration and injection of such substances as ether, formalin, or glycerine; simple incision without a tube, packing of the joint with gauze, laying open the joint by turning back the patella, with perhaps full flexion of the joint, were all measures useful in given cases. Failing benefit from any of these, amputation was the only resource. In the shoulder and elbow excision had been followed by good results. In the hip it was occasionally necessary to remove the head of the bone in order to drain the joint, and he described several cases in which life had apparently been saved thereby. Colonel Fullerton concluded by dealing with the means used in France to immobilise fractures, and exhibited the splints in general use, as well as Major Sinclair's apparatus for suspending limbs in splints and Captain Bryan's segmented suspended bed.[1]

[1] See our present issue, p. 25.

MEDICAL MAGISTRATES.—Mr. Arthur Henry Headley Huckle, M.R.C.S., L.R.C.P. Lond., and Mr. Cecil Christopherson, M.R.C.S., L.R.C.P. Lond., have been placed on the commission of the peace for the borough of Hastings.

THE LATE DR. ROBERT KINGDON ELLIS.—Dr. R. K. Ellis, who was fatally injured at a railway crossing at Isipingo, near Durban, on Nov. 20th last, at the age of 54 years, was a popular member of the medical profession in Durban and district. He was at one time Government medical officer in Basutoland, and later resident surgeon at Durban Hospital. At the time of his death he was in practice at Isipingo. Dr. Ellis was one of the most kind-hearted of men, and his sudden death is felt as a great loss to the community to whom he ministered. He leaves a widow and daughter.

Reviews and Notices of Books.

A System of Medicine.

By Eminent Authorities in Great Britain, the United States, and the Continent. Edited by Sir WILLIAM OSLER, Bart., M.D., F.R.S., Regius Professor of Medicine in Oxford University; assisted by THOMAS MCCRAE, M.D., F.R.C.P., Professor of Medicine in the Jefferson Medical College, Philadelphia. Second edition, thoroughly revised. Illustrated. London: Henry Frowde and Hodder and Stoughton. 1915. In five volumes. Pp. 5500. Single volume, 35*s.*; the five volumes, £7 15*s.*

THE appearance of a second edition of this great System is not only a source of sincere gratification to the editors and to the publishers, as Sir William Osler and Dr. McCrae state in their brief preface, but is also a great boon to the medical public.

The international character of the System may be gathered from the following analysis of the 96 "eminent authorities." The United States have contributed 74 of these, 11 each from the Universities of Pennsylvania and Harvard, 7 from Johns Hopkins, and 5 from Yale. Great Britain follows with 14 contributors, 10 of them from London, 2 (including the editor) from Oxford, and 1 each from Liverpool and Edinburgh. Canada follows with 6, five of them from McGill University. Germany and Japan contribute one each—namely, Dr. W. P. Dunbar, of Hamburg (Asiatic cholera), and Dr. K. Shiga, of Tokio (bacillary dysentery). Six years only have elapsed since the completion of the first edition, and the opportunity of revision has occurred before most of the articles in the System have become seriously out of date. The editors say that the revision has been thorough and that certain important changes have been made. The new, or practically new, sections will be found on pellagra, beri-beri, trypanosomiasis, Malta (undulant) fever, and electrical diagnosis in cardiac disease.

A praiseworthy attempt at condensation has been made in spite of steadily increasing subject matter, and this has been carried out by abridging the etiological and pathological sections rather than those on diagnosis and treatment. On the contrary, special stress has been laid on these two latter throughout the five volumes. The condensation has resulted in five volumes instead of seven, and a total number of about 5500 instead of the 6200 pages of the first edition. Each volume is approximately the same size as before; type and paper have been altered, the former is larger, the latter more shiny. We are old-fashioned enough to prefer them as they were. Ease of reference is provided by an index at the end of each volume and a general index at the end of the last. As the volumes have apparently been published simultaneously no inconvenience has attached to this arrangement of indexes. We question, however, whether with a System of this size it is not preferable to have a single detailed general index printed either separately or repeated at the end of each volume. Minor criticisms might include the absence of any list of illustrations and of any complete index of authors, although the names of these are given at the opening of each volume. More serious is the capricious distribution of the illustrations. To take an example: for the 235 pages devoted to tuberculosis there are but two, one a small graph of mortality returns in phthisis, the other a

full-page plate of a form of apparatus for artificial pneumothorax. The articles on small-pox and vaccination contain, on the other hand, 11 full-page plates.

We hope that the editors may consider the issue of a supplement of illustrations to the System. They will thus complete the obligation under which they have placed the profession of medicine in issuing a book which is a library in itself and the use of which can often take the place of laborious search through masses of contemporary literature.

A Manual of Pharmacology.

By WALTER E. DIXON, F.R.S., M.D. Lond., Professor of Materia Medica and Pharmacology at King's College, London; University Lecturer in Pharmacology, Cambridge. Fourth edition, completely revised. London: Edward Arnold. 1915. Pp. 467. Price 15*s.* net.

THREE years have elapsed since the third edition of this work was reviewed in these columns.[1] What we had to say then in commendation of the work is equally true of this "completely revised" edition—indeed, a perusal of it and a comparison with the previous editions show it to be almost a new volume, so largely have some parts of the text been rewritten. This change is due to two causes: first, the great increase in our knowledge of the action of drugs, largely the result of experimentation on animals and investigations on surviving excised organs of animals. The second cause is that the production of the new Pharmacopœia has necessitated the revision of the materia medica, though it has not entailed the introduction of any new drug which was not described in the earlier editions. With the new Pharmacopœia came the introduction of the dual system of dosage. It will take some time before the decimal system supersedes the old and more familiar dosage system. The number of tracings, already large, has been increased; a few new figures have been added, which raises the total number of excellent well-printed illustrations to 91.

So far as the arrangement of the text is concerned, the number of chapters, their titles, and the list of their contents are practically the same as in the first edition, but an intimate study of the contents of each chapter shows large advances in our knowledge. To take, for example, the group of cardiac tonics, including digitalis, strophanthus, and squill, we find the few pages dedicated to an explanation of cardiac physiology as a basis for the study of cardiac drugs to be most illuminating. The exposition on digitalis has been recast, and in the study of its physiological relations the decerebrate animal has been utilised. Amongst the vegetable hypnotics the subject of morphine has been similarly recast and rewritten, and the same may be said of strychnine. In the chapter dealing with drugs acting on nerve-endings—e.g., atropine—some of the pages are practically identical with those in the first edition, but in others very considerable modifications and additions have been made. Not the least interesting part of this chapter is the author's attempt to explain in a simple manner the mechanism by which such drugs exert their action on "nerve-endings." The printing of some of the tracings in this chapter does not appear to come out so clearly as in the corresponding figures in the first edition.

The reader who would profit to the full by a study of this work must have a good general knowledge of physiological methods, as well as be conversant with the results of modern physiological teaching. Even many physiologists will find much to learn in these pages. No one at the present day can write a good and discriminative text-book on pharmacology who has but an imperfect knowledge of modern physiology. This work is based on sound physiological knowledge on the part of the author.

The fourth edition of this work will add to the high repute which the author has attained in the domain of pharmacology—a repute well reflected in the tersely written and systematic treatment of a subject which in some respects has hardly gained that attention in the medical curriculum which its high practical value demands.

[1] THE LANCET, Nov. 9th, 1912, p. 1304.

Diversions of a Naturalist.

By Sir RAY LANKESTER, K.C.B., F.R.S. London: Methuen and Co. 1915. Pp. 424. Price 6*s.*

THE authorship of these essays relieves the reviewer of one tiresome duty—the search for error, apt at times to be so prevalent in the popular exposition of science. Here we have the leisurely work of our first zoologist, to whom the actual facts with which he deals are known from many years' experience in the field, as well as in the laboratory. We can, therefore, sit down and read without the obtrusion of any anxious doubt as to the statements.

Sir Ray Lankester wanders about in his 41 chapters from place to place, and from subject to subject. We start, for instance, fairly early in the morning in Sussex, but immediately depart for Norway to dredge for rhabdopleura in a deep fjord. Rhabdopleura duly dredged up and pickled for future reference, we hasten back to Sussex to consider the fragmentary skull of primæval man. This discovery leads us to a dissertation on the ape brain and the ape mind, and, by a not unnatural transition, to divining rods and other examples of the unintelligent or dishonest divagations of the human brain. Upon all of these latter topics the author is crystal clear, permitting no haze of any kind. He sees only sheer swindling or ignorance. Moreover, a detailed account of the processes adopted in a particular case by an alleged expert in the use of the divining rod is given as a proof of the necessity for this uncompromising attitude. Many of the articles are quite purely zoological, and the eminent writer does a useful work in bringing clearly before the lay reader the salient facts in the history of the barnacles, the classification of crustaceans, the mode of life and organs of the living body among worms, and such-like topics. The less instructed reader will delight in such chapters as that on amber. To many of us, probably to most of us, the idea of blue amber is a novelty; yet the author comments upon the fact that this fossil resin is not always yellow or golden, but occasionally deep red and even blue. Sir Ray Lankester reminds us that amber is mentioned in Homer; it is mentioned, as a matter of fact, twice in the Odyssey, as forming part of a gold necklace. Its rarity, thus suggested, was doubtless due to the fact that the Baltic was then, as now, the chief source of supply. But the sources of possible "amber" are increased when we learn from Sir E. Ray Lankester that the African copal and the New Zealand dammar can at times be fossilised or semi-fossilised and lead to what may be regarded, perhaps, as a fraudulent substitute.

There are other matters on the outskirts of zoology with which the author concerns himself in the same interesting way. The legend of the origin of the Bernicle goose from the barnacle receives some highly readable comment. Sir Ray Lankester scoffs at and rejects Max Müller's explanation of this myth, and terms it "an excellent case of the misuse of hypothesis." The Brent goose, thought Max Müller, was called Berniculus by the clergy as a diminutive of Hibernicus—a "little Irishman," in fact. This appears, however, to be a sheer invention, and was made to explain the legend instead of the legend explaining any fact. The author himself is not so bold as Max Müller in any attempted explanation; but he quotes from students of Mycenæan pottery who have at any rate shown that in the ornamentation of this pottery a leaf of a tree is gradually converted into the similitude of a goose and also of a barnacle—thus is the Irish legend of monkish origin largely antedated. We are inclined to believe that the story of Dick Whittington's cat, quoted by Sir Ray Lankester as a just instance of the origin of a legend from the change of meaning of a word, has not the significance which he thinks. He holds that the Norman French "achat," very likely pronounced "acat," which means commerce, was, indeed, the origin of Dick Whittington's fortune. This view can be traversed. The domestic cat of this country, which is not the offspring of the European wild cat, was introduced, and was a rarity at one time. The derivation of the word puss, which has been held to be from Persia, or from Pasht, or Bubastis, is indicative of the non-English character of the cat. Association with a cat was a sign of wealth, as witness the evergreen story of Puss-in-boots.

Sir E. Ray Lankester's diversions make thoroughly amusing reading.

Life: A Poem.

By BASIL GORDON MORISON, M.D. With a Preface and Biography of the Author. London: Baillière, Tindall, and Cox. 1915. Price 3*s.* 6*d.* net.

To those who knew Basil Morison this little volume, which contains also a biographical memoir of the author, will be of value for his sake; and to others who did not know him it may show the manner of man that he was. From the preface we gather that the poem was written, probably in the last year of the author's life, to give concrete expression to ideas on which he had pondered long and deeply. The day before his death—which he knew was imminent, and which he regarded with unruffled composure—he told his wife that he had written a few verses "which might be considered worth publishing." The poem takes the form of a dialogue between man and the spirit of life. In its opening verses it describes the course of normal and happy human existence in a measure which recalls the cadence of Gray's "Elegy," while many of the verses are reminiscent of Omar Khayyám, although the philosophy expounded differs wholly from that of the writer of the "Rubáiyát." If his life had been prolonged Basil Morison might have been inclined to extend and amplify his theme, and to finish the poem on a yet more exultant note of assurance. Such stanzas as the following show that although Morison turned late to metrical form, he had much facility in that medium:

A PRAYER.

Lord, of Thy goodness and Thy power,
  Provide me that I be
Furnished with strength to meet the hour
  Of my necessity.

Resolved, and calm, not slow, nor fain
  In weakening doubts to stay,
Alert, yet so that I retain
  Thy guidance, and obey:

Deny me pride that seeks a fall,
  Forbid servility;
Give that most gracious grace of all,
  Give me humility.

A friend of Morison writes to us as follows of the book: "To one who has lived more than half his life in Stoke Newington, and who was honoured by his unbroken friendship for more than 30 years, the Memoir is especially interesting. The 'Smallest Borough in London' has always been proud of its literary associations, to which another is now added; while, to very many of its present inhabitants the sunny smile, the ever-cheerful greeting, and the overflowing vitality of the author of 'Life,' will be a happy and abiding memory."

JOURNALS.

Journal of Anatomy and Physiology. Conducted by Sir WILLIAM TURNER, K.C.B., Professor ALEX. MACALISTER, Professor ARTHUR THOMSON, Professor ARTHUR KEITH, and Professor ARTHUR ROBINSON. Vol. L. Third Series, Vol. XI., Part I. October, 1915. London: Charles Griffin and Co. Annual subscription, 21*s.* post free. — The longest and most important paper in this issue is one by Professor J. E. Frazer and Dr. R. H. Robbins on the Factors Concerned in Causing Rotation of the Intestine in Man. The subject is a very wide one and the title itself suggests an initial comment, for it is obvious that no explanation can be concerned with this rotation in man alone; the underlying factor which operates in man must be capable of application to the mammalia generally. It appears to be a merit of this paper that the greater part of it is capable of standing the strain of this wider extension. Two distinct problems are involved in this study: first, the primary fixation of definitive portions of the alimentary canal; and secondly, the causation of rotation in the loop dependent between the primary fixed points. The first question has been given a wider significance even in the short while that has elapsed since the reading of this paper, and it is one destined to be carried yet further. The second question we imagine the authors have largely solved, in some if not in all of its distinctive stages.—Professor Arthur Thomson contributes a long and exceedingly well-illustrated paper upon the Presence of Genial Tubercles in the Mandible of Man and their suggested Association with the Faculty of Speech. The article deals with far more than the mere presence of these tubercles, for it is a study of many features of the lower jaw; and it might be added that research of this magnitude is hardly needed to demonstrate that the human faculty of speech has nothing whatever to do with any trivial moulding of the mandible. The whole structure and variations of the region of the symphysis receive ample treatment, and the paper is a valuable record of the conditions present in a very large series of cranial types. But it is, perhaps, a pity that the author should create an impression that such an elaborate research, valuable for its own sake, was necessary to determine if a cerebral evolution like the power of speech depended on the mechanical presence of these inconsiderable features.—A paper upon the Homologies of the Chelonian and Mammalian Types of Genitalia, by Professor F. Wood-Jones, continues and sums up the previous articles in the journal contributed by the same author. The writer contends that from the Chelonian condition mammalian evolution, in respect to the genitalia, has taken place along two lines which result in distinct types of adult external genitalia. The paper is illustrated by drawings of actual embryos.—Mr. F. J. F. Barrington contributes an article on the Mucinous Changes of the Vaginal Epithelium of Certain Mammals in Pregnancy. The changes, as shown by the excellent coloured illustrations, are distinct enough and are obviously of some very real functional importance. But, as the author shows, there is a bewildering inconstancy from species to species and even among individuals of the same species that tells plainly that more work is required

in this field before we may draw definite conclusions.—Mr. W. E. Collinge records and illustrates an interesting and valuable series of abnormal developments in the vascular system of the frog, and most of these anomalies obtain a ready explanation from the known stages of development of the vascular system.—A paper upon the Developmental Changes in the Pericardium, the Mesocardia, and the Pleural Sacs of the Human Embryo, by Professor David Waterston, deals with some difficult problems in embryology. The paper is illustrated by drawings of reconstruction models; and since these models have been placed upon the market they are open to further study and comparison with earlier and later stages of the human embryo.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

THE EDINBURGH ANTISEPTIC EUSOL.

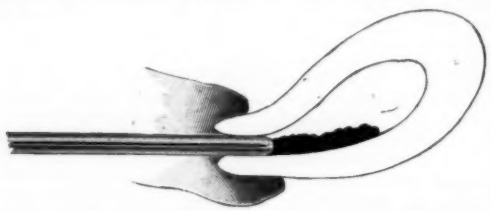
(MESSRS. DUNCAN FLOCKHART AND CO., 104, 106, 108, SOUTH CANONGATE, EDINBURGH.)

THIS enterprising firm has hit upon a convenient way of extemporaneously preparing a solution of hypochlorous acid for antiseptic purposes. They issue a case containing packets of boric acid and of chlorinated lime respectively. Of course, chlorinated lime is very susceptible to deterioration under the combined influence of moisture and the carbonic acid of the air. This deterioration is successfully prevented by packing the bleaching powder in heavily waxed paper. The claim that the activity of the chlorinated lime is thus preserved is substantiated by our examination. Thus we found that the available chlorine present amounted to 29·82 per cent. This approximates to the French standard of 100° of chlorine gas. Since hypochlorous acid is the active agent concerned, we are led to believe that bicarbonate of soda might well be substituted for the boric acid, with the additional advantage that it would have acid-neutralising properties. When bicarbonate of soda is mixed with chlorinated lime the solution contains hypochlorous acid in spite of the presence of the bicarbonate. The fact is that hypochlorous acid is easily expelled by carbonic acid from the hypochlorite. If it were not so, bleaching powder would be of little use employed in the ordinary way, since it is not until the carbonic acid in the air acts upon it that its disinfectant and antiseptic properties become potential.

IODARGOL UTERO-TOPIQUE.

(MESSRS. M. BRESILLON AND CO., GAMAGE BUILDINGS, HOLBORN, LONDON, E.C.)

The value of iodargol in obstetrics has been often asserted and good results in certain uterine affections might be anticipated in view of the fact that



iodargol presents iodine in colloidal form. An apparatus for the treatment of metritis and known as the utero-topique has recently been introduced by M. Bresillon and Co. Its action will be understood from an inspection of the accompanying illustration. It consists of an injection tube, or cannula, attached to a collapsible metal container in which is the supply of iodargol in a jelly-like medium. This is expelled in a quantity under complete control by a key the rolling over of which gradually discharges the contents. The illustration shows the cannula in position in the cervix. The cannula is grooved in order to allow of the escape of air as the cannula enters. Iodargol has been used for general antiseptic treatment of both the male and female genital passages.

(1) "TABLOID" SODIUM ACID SULPHATE; (2) COMPOUND MENTHOL SNUFF.

(MESSRS. BURROUGHS, WELLCOME AND CO., SNOW HILL BUILDINGS, LONDON, E.C.)

1. The bactericidal action of sodium acid sulphate deserves more attention than it has hitherto appeared to have received. It is very rapid in destroying the typhoid organism, and this should render it of great service to the soldier in the field. He has only to add a tabloid of sodium acid sulphate to a pint of water and leave it for half an hour when he can be confident that the water is safe to drink. The slight acid taste which the addition of bisulphate gives is not objectionable, and in the tabloid a small amount of sweetening agent is present which renders the water palatable. 2. Compound menthol snuff is well known as affording relief in the treatment of common colds, nasal catarrh, and so forth, but its application has been materially improved for export purposes by packing it not in metal boxes, but in a watch-shaped glass bottle. This preserves the menthol intact, and is particularly suitable for use in tropical countries.

VITAMOGEN.

(MESSRS. WILLIAMS AND CO., 24–26, HOLBORN, LONDON, E.C.)

The name of this preparation implies the presence of the so-called vitamines. It is difficult to confirm chemically any claim on this ground since the chemistry of vitamines has not yet been definitely settled, and the particular substance extracted from yeast and the outer layers of rice gives, so far as we are aware, no definite chemical reactions. Following, however, the method enjoined for the extraction of vitamines from substances containing them, we obtained an alcoholic extract from vitamogen, after fat had been removed, which gave distinct evidence of the presence of a basic body. Vitamogen contains all classes of food as shown by our examination—proteins, carbohydrates, fats, and mineral salts rich in phosphates. According to recent work vitamine is a base and not a phosphatide. We do not know how vitamogen is prepared, but presume that it contains vitamine extracted from a vitamine-containing food product, which might be yeast or a cereal. We found starch cells present. The particular claims of the preparation can only be proved by practical trial, and it seems worthy of such a test.

THE LATE DR. G. A. HERON.—At a meeting of the Council of the London and Counties Medical Protection Society, Limited, held on Dec. 16th, 1915, at the offices of the society, under the presidency of Colonel E. C. Bensley, it was unanimously resolved: "That the members of the Council desire to put upon record their very deep sense of the great loss sustained by the society by the death of its President and Chairman of Council, Dr. George Allan Heron. During the 23 years that Dr. Heron was chairman, he had devoted his valuable time and best energies to the interests of the society, for which the Council and members cannot fail to be sincerely grateful."

THE LANCET.

LONDON: SATURDAY, JANUARY 1, 1916.

Thrift.

ONE great message of the new year is the need for thrift. The press has been considerably occupied of late with the subject, and especially of thrift in connexion with the sphere of women as the stewards of home life, but there is not so far much evidence to show that any of us, males or females, have taken to heart the widespread injunctions to economise. And yet it is increasingly evident that victory may be largely decided by thrift. As the war has gone on the organisation for spending in all departments has become more elaborate; no similar organisation for saving has been attempted. And we confess that organised national thrift is difficult to contemplate, so far as it takes the form of domestic economy, for that is a thing which in this country is quite individual. But it is a serious question whether it should remain so, or whether an attempt should not be made to instruct the public in some authoritative manner upon how to get the best values for a modest expenditure. There may be no sort of need in this country for "fatless days" or "meatless days," but we are spending weekly the revenue of a respectable province, and with the many adjurations to economy emanating from the bench, the pulpit, and the inkstand there has seldom been combined any accurate scientific advice. It is only necessary to pay a visit to the manufacturing towns of the West Riding of Yorkshire to see how reckless is the expenditure in consequence of the great trade boom which is still going on there. The standard of living has increased in the last 12 months, and we have been told that the sale of pianos and motor-cars testifies to the great profusion which exists. This may be picturesque reporting, but we hear, too, that in many parts of the East of London investment has taken place of late in furniture and even in jewellery rather than in war stock. In willingness to economise and to place individual resources unhesitatingly at the service of the State we fear that we are very greatly behind Germany.

In Germany before the outbreak of war the necessary measures for household economy were widely known, and these were put into practice immediately on the commencement of hostilities. In a few months there appeared a comprehensive and scientific study of the problems presented by the feeding of a nation, written not exactly for popular reading, but so that any scientific person could explain to the public the principles of economic food-supply. A summary of the book appeared in our columns,[1] the book itself being subsequently done into English with a preface by Professor A. D. WALLER. The public press quoted freely from our summary at the time, but rather with the idea of calling attention to the success of the British naval blockade than of pointing to the value which such domestic organisation might prove to possess. We would suggest a restudy of the document now to draw from it what instruction we may. Our need for thrift is not as urgent as that of our enemies, but economy means money and a quicker end to the war. The medical profession might lead the way in a thrfft crusade, and perhaps the medical women are especially indicated to undertake this great task, but we do not know that the public is looking to us for initiative in thrift, or would find a united profession on the subject. Here, indeed, there is room for drastic improvement. The value of foodstuffs is now established on a scientific basis, and food can be measured in heat values without any risk of gainsaying. The story of a district council, acting on medical advice in refusing to sanction the use of margarine instead of butter in their tuberculosis pavilion, is unfortunate at the present time, and Dr. A. NEWSHOLME was stating a well-established fact and not merely his own opinion when he wrote:—"There is no reason to suppose that margarine is less nutritious than an equal quantity of butter, and it certainly has no harmful or deleterious effect." When he added: "I am using margarine in my own household," we imagine that he was merely saying what would be the practice of every household in the land that had given any intelligent consideration to food economy. HINDHEDE has recently fed two workmen over a period of many months on potatoes and margarine only, and has kept them in good health on this sufficient but unattractive diet. Fortunately in this country with its free imports there is no practical risk of being condemned to a diet of such monotony as this, but none the less the need for avoidance of all useless extravagance is the same. Much is heard of the hardship of the employment of war bread by the Central Powers, but no one who has ever grasped the value of a more complete utilisation of the germ than in our invariable white bread will ever consent to continue to waste so much of the valuable part of the grain. Before the war the reason for the growing prevalence of white bread in Northern Germany was one of economy, based on LIEBIG'S teaching that the outer layers of the wheat grain were better utilised by the pig and the cow, and thus indirectly as pork and milk, than directly by man himself. Now that wheat cannot be in Germany legally given to cattle and pigs in any form, this theorem has been disproved, and

[1] The Food-Supply of the German People, THE LANCET Feb. 25th, 1915.

there is no difference of opinion as to the value of the 75 per cent. ground wheat. If we continue our preference for white bread we should at least make sure that the rest of the grain is really used for fodder.

Thrift does not consist solely in eating margarine and wholemeal bread, although this would mean a great deal if the saving were invested in War Loan. The whole diet-sheet should be intelligently supervised and, if need be, amended. And in so doing we should like to call attention amongst other guides to an admirable pamphlet[2] by the professors of agriculture and of bio-chemistry at Cambridge. There we read that: "Comparing the expenditure of the poor with that of the well-to-do, we find that the former get nearly twice as much for their money." Here is the opportunity for the woman of the well-to-do household to give her family the same amount of nutritive material whilst at the same time crediting much of the usual expenditure to her savings-bank account. We believe that the medical profession, and especially the medical women of the country, could organise a thrift crusade on healthy lines, and are sure that in so doing they could command the finest and most willing scientific advice; but such a movement would need the full support and coöperation of all local authorities so as to remove the slightest suspicion of medical dictatorship. Further, we believe that the time has come, and indeed has been upon us for some months, when a national movement should be made in this direction.

Wounds of the Abdomen.

THE treatment of wounds of the abdomen remains one of the most difficult problems presented to the surgeon during the war. On the one hand, he cannot rely on the experience of the past, and, on the other, the lesions which may be produced vary enormously; they may result from the swiftly moving rifle bullet, the less rapid fragment of a shell or the shrapnel bullet, or may be the result of the almost spent projectile or the thrust of the bayonet. The experience of the past will not aid the surgeon greatly, for not only is the violence of the wounds inflicted greater than that met with in previous campaigns, but the conditions are considerably different, because of the number of the injured brought to the surgeon at one time. In this war of huge armies the crowds of wounded arriving after an engagement may be so great as to tax to the utmost the resources of any hospital, and abdominal wounds in particular require for their treatment some time for reflection and some elbow room. In THE LANCET last week we published the Bradshaw lecture by Sir ANTHONY BOWLBY upon this subject and in the previous week an important paper by Colonel CUTHBERT WALLACE. This week we publish a further paper by Captain W. C. B. MEYER and Lieutenant D. C. TAYLOR, a note to this last paper having been written by Sir ANTHONY BOWLBY. All this material gives us ground on which to reflect with a view to arriving at solid deductions. It is, of course, only penetrating wounds of the abdomen which we are considering, for a wound of the abdominal wall which does not penetrate beyond the superficial structures is usually of little importance. Now it may be difficult, and sometimes it is even impossible, to determine with absolute certainty whether an abdominal wound does or does not penetrate, and therefore statistics as to the number or proportion of wounds of the abdomen, as compared with injuries of other parts of the body, cannot be absolutely exact, and a comparison of the effect of expectant and operative treatment must always be to a small extent vitiated by this fallacy. Nevertheless, we can gain a fair idea as to the relative frequency of these injuries, and we find that in "field ambulances" we meet with a little under 2 per cent. of abdominal injuries, while in "casualty clearing stations" the percentage has fallen to about a third of this number. Colonel WALLACE accounts for this reduction in the percentage by the very heavy mortality amongst abdominal cases at field ambulances, so that a large proportion of the injured never come to the care of the surgeons at the clearing stations. At all events, it is clear that the percentage of cases of abdominal injuries which will come under the care of the surgeon for operation is not great, though he may be hampered in their treatment by the vast aggregate of the wounded.

At the beginning of this war the treatment adopted was under the influence of the practice employed in the South African War. Very few cases were submitted to operation, and the results then obtained were not calculated to increase the number of cases in which such submission would appear advisable. After a time the results of post-mortem examinations showed that a number of cases had died in which a timely operation might certainly have saved life, and gradually operations have come to be performed in a higher percentage of cases. The communications to our columns already cited give a striking account of the results which have been obtained up to the present, and suggest perhaps more optimistic views than have hitherto been held. Both post-mortem examinations and operations have shown that by far the most frequent cause of death is hæmorrhage, and it is also clear that if the patient does not die from hæmorrhage, he will almost certainly die from peritonitis if the intestine has been opened by a bullet or a fragment of a shell. But we also learn that it is possible for a bullet or a fragment of a shell to traverse the abdomen without wounding the bowel, and that even many wounds in which perforation appears to have occurred are not penetrating wounds at all. The elaborate

[2] Food Economy in War Time. By T. B. Wood, M.A., Drapers' Professor of Agriculture; and F. G. Hopkins, M.A., F.R.S., Professor of Bio-chemistry. Cambridge University Press. 1915. Price 6d.

tables which are attached to the paper by Captain MEYER and Lieutenant TAYLOR show that operations were performed in only about half of all the abdominal cases admitted in the district; in some cases this was because the patients were moribund and past help, but in other cases because an operation was not considered necessary; and this opinion was certainly justified by the fact that not one of the patients died for whom no operation was thought necessary. Operation appears to be least necessary with wounds in the epigastric or hepatic regions, especially in antero-posterior wounds, if no definite symptoms are present; but if there are any signs of continuing bleeding, an operation must be undertaken. A wound of the stomach is less likely to be followed by peritonitis than a wound of the small bowel, for the mucous membrane of the small intestine pouts into the wound and increases the risk of peritoneal infection, while the gastric mucous membrane does not protrude. Therefore, a wound of the stomach is in itself less serious than wounds of the small intestine. Sir ANTHONY BOWLBY points out that all wounds without exception which seem likely to involve the area of the small or large intestine should have an exploratory operation and this should be followed by a laparotomy if the peritoneum is found to be wounded. That is one great lesson we have now learned. An operation should also be done in all cases of wounds of the gluteal and lumbar regions where the symptoms point to a visceral lesion. The statistics show that out of a total of 50 abdominal cases the stomach or intestines were wounded in 34, and of these patients no less than 21 recovered. It is almost certain that not one of these patients would have survived if no operation had been performed.

To sum up the present situation. When the hospital facilities are obtainable, and when the patients can be seen within a reasonable time of the infliction of the injury, a patient who has a penetrating wound of the abdomen should have a laparatomy performed, and then he will have the best chance of recovery, whether he is suffering from hæmorrhage or from perforation of a hollow viscus. Undoubtedly, many cases will die in spite of the operation, but a large proportion will be saved who otherwise would have succumbed either to the loss of blood or to peritonitis. Where the conditions will not allow an abdominal section to be made because either time or facilities are wanting, then the best that can be done will be to keep the patient without food for several days. Then some of these cases will recover, but it will in almost all cases be impossible to be sure that any wound of abdominal vessels or viscera has occurred. It is yet early to expect statistics of a large number of cases, but before long we shall be able to learn with more certainty the effect of early and skilled treatment of perforating wounds of the abdomen. Our impression is that we shall receive gratifying information.

The Supply of Medical Men for the Army.

THE position of medical men with regard to the needs of the army remains the most momentous professional question of the hour. With our fighting forces shaping towards the vast total of 4,000,000 it needs no imagination to see that the resources of medicine, of surgery, and of scientific sanitation in all its branches are going to be heavily drawn upon. The public was reminded by a letter which appeared on Dec. 16th last in the columns of the *Daily Telegraph*, signed "M.D., F.R.C.S.," that the question of how sufficient medical men are to be found for the army is one which concerns the whole population of the country rather than the army or the medical profession only; and though we do not think that the letter itself was a particularly useful or well-informed one, we welcome its underlying message. The reminder was not required as far as THE LANCET was concerned. We have throughout been insistent on due thought being taken for the needs of the civil population, and have given at different times reasons for our views which we do not repeat, for they were so obvious that most will guess them. Truly, it may be assumed that all medical men, all military authorities, and all leaders of political or social thought desire exactly the same things—success to our armies, and the safeguarding, at the same time, of our civilian population from the worst of the ills attendant upon the war. Those who are not in agreement so far can be left out of all count, while the only difference of opinion existing between the rest of us turns upon the question to what extent the civilian population shall be sacrificed so that the naval and military forces may make good their endeavours to set right the monstrous evils that have been thrust by German ambition upon Europe.

The War Office has said, and the War Office continues to say with increasing emphasis, that more medical men are required for the army. It is perfectly easy to reply that the War Office is in error, but it is not so easy to see how those who make this reply come to be possessed of the complete information necessary to support their position, or to understand why the War Office should deliberately embarrass the medical profession by making untrue statements. Some weeks ago the Central Medical War Committee, when that body was recognised by the War Office as the official recruiting medium for the medical profession, was warned that 2500 medical men would be wanted for the army early in 1916. Since then the Prime Minister has foreshadowed an addition to our army of a million men. If some 2500 medical men were required with the army before this pronouncement, we may be certain that at least 3500 or 4000 are now required, unless complete reorganisation of the Army Medical Service can be

contemplated at the present juncture. At the same time there are signs that the civilian population is feeling the shortage of medical men, though to what extent it is difficult to say. From some localities one story comes, from other localities another. It is certain, however, that for a long time institutions of all sorts have been unable to obtain resident officers, and that public authorities have been obliged to put up with depleted staffs and to restrict their energies accordingly. Now everyone can see that there is here a point at which danger to the country, as real almost as danger from the presence of an armed foe, might come from the absence of proper medical and sanitary precautions at home. It is imperative that the public health of the country should be kept in a good state, if only that munition workers and those directly concerned in supporting the effectiveness of our army and navy should enjoy good health, and that recruits should be drawn from wholesome sources. Let us place this demand on medical service, if only for the sake of argument, as in no respect second to the direct demand of the War Office, and the position is at once clear—there is only a limited supply of doctors, urgent claims are made upon them in two directions, and economical use of them is the only way out of the difficulty. But no one can say, If you take precisely this number of doctors away from the civilian population you approach or pass the danger-point. And, similarly, no one can state that the army requires an exact number of medical men by an exact date—the War Office attempts no such excursion into prophecy when demanding increased medical assistance. All that can be done is to husband resources, and to apply to the situation the rule that must be observed in every other set of circumstances while we are under the tyranny of this war: namely, that during the adjustment of supplies the civilian population must go short—quite short, if need be, so that the army may be well supplied—quite well supplied. For in civilian situations there is time to cope with emergencies, while military needs are invariably urgent and have to be met in excess of probable requirements as the only way to guard against surprise. The phrase "too late" has occurred rather frequently in explanatory speeches dealing with our military undertakings, and it should be the ambition of every medical man to see that in no circumstances can these words be applied to medical recruiting.

We may fairly urge upon the War Office the need for making every reform that is possible, so as to use with the nearest approach to parsimony that is safe the quota of medical men who can be spared from civilian needs. But we must not assume that, because somebody knows of some place or other where the medical officers are for the moment but lightly tasked, the demands of the War Office are disingenuous, and could be met by a little reshuffling of the supplies in their hands. The army must be made safe; it should be sheltered from the dangers that can be estimated, and should possess reserves with which to meet the unexpected. Therefore the civilian population must be prepared to endure sacrifices. This is a side of the matter which is not sufficiently recognised, and the sooner it is understood by the public the better. That same public which can no longer walk with ease and safety about the streets because the supply of lights is curtailed, which can no longer call for its pipe, its bowl, and its fiddlers without much closer restrictions than in times of peace, will have to learn that medical attention can be given in a perfectly adequate manner by a smaller number of medical men than is usually available, if the people will help in every way to spare the depleted ranks of medicine unnecessary trouble. It is inconvenient to have to wait a long time for a doctor, it is disappointing not to obtain the services of the preferred man, it may be a tragedy for an operation to be postponed. These things may have to be endured. The work of public authorities cannot be so comprehensive when the staffs are inadequate, but some of the medical energies of these authorities are spent in correcting the errors of the public, who must take greater heed on their own initiative to the rules of sanitary life. We know that the National Health Commissioners are under a contract with regard to panel patients: it may be that the panel patients will not obtain all that they consider they have been promised, but we are certain that the medical profession is doing and will do all that is possible in the existing situation.

Annotations.

"Ne quid nimis."

THE INFLUENCE OF ALTITUDE ON THE NERVOUS SYSTEM.

IT appears from an interesting communication in the *Aeroplane*, under date Dec. 15th, that certain officers of our flying service have suffered from some intangible disease which for lack of more definite diagnosis is put down as "neurasthenia"; the functioning of the patient's nerves is so affected as to make him incapable of flying safely or usefully; he crashes his machine every time he lands, or his eye is spoiled for observing or shooting. Such symptoms are usually summed up by saying that the man is "off his form," but the writer specifies other symptoms of a more precise nature. These have been referred to also in a recent number of the *Deutsche Medizinische Presse* under the name "flying sickness," and they are said to be caused mostly by "rapid changes of altitude whereby the differences in air pressure and temperature make themselves seriously felt, causing headaches, ear-drumming, and difficult breathing. An aviator overcome by such symptoms lands in a state of complete mental and physical collapse. His head is 'splitting' with almost intolerable pains, but relief usually ensues on account of the deep sleep into which the victim automatically falls." The English writer also

mentions the occurrence of severe pains in the eyes, and declares that the sleep above referred to is like a drugged sleep, so profound is it. It appears, further, that when service flying usually took place at heights of 3000 to 4000 feet these cases did not present themselves, whereas since "improvement in anti-aircraft guns and gunnery has made 10,000 feet an ordinary reconnaissance height, and 12,000 to 15,000 a common height in crossing enemy lines" the question of variations in pressure and its possible relation to this curious pathological state obviously become matters worthy of serious attention. The writer in the *Aeroplane* makes the interesting suggestion that possibly the disease is an exact inversion of caisson disease, not occasioned, however, by excessive or insufficient pressure, but by sudden differences of pressure. An aviator will come down with a speed frequently exceeding a hundred miles an hour, at an angle of "one in one," so that "it is possible that the change from the low pressure at 10,000 or 12,000 feet to ground level in a few minutes may produce precisely similar effects to that produced by excessive pressure when diving."

After years of controversy and conflict of theory it has been established by exact experiment that the cause of caisson disease is that nitrogen dissolved in the body under pressure forms bubbles on sudden decompression and obstructs the circulation. From the most trifling disturbance to sudden death all symptoms alike are thus produced. It must be noted that it is the partial pressure of nitrogen in the atmosphere and not the general atmospheric pressure that is the important factor. P. Bert, for instance, exposed an animal to high pressure in an atmosphere poor in nitrogen and rich in oxygen without any untoward result, though decompression was rapid. Dr. Leonard Hill has shown that other factors are of great significance. Thus, it is not compression but decompression that gives rise to symptoms. Compression up to 4¼ atmospheres is not in itself to be feared; the return to the normal pressure is alone to be dreaded. "The risk is proportional to the period and degree of compression and to the rapidity of decompression" (Hill). Where the activity of the circulation is great enough the nitrogen surplus will be carried away and escape by the lungs, whereas where it is slower and where the tissues are fatty—since fat absorbs five times as much nitrogen as water—the risk of bubble formation is very great. It is for this reason that the familiar "bends" occur in relation to joints and fasciæ, and that the white matter of the spinal cord is commonly involved. From the rapidity of the circulation through it brain symptoms are scarcely ever met with in caisson disease. Hill has also demonstrated conclusively that the pulse-rate, the blood pressure, and respiration are but little altered by air compression *per se*.

"Flying sickness" in its more essential particulars is rather removed from caisson disease, and is deserving of careful clinical and scientific investigation. It raises matters of interest in connexion with so-called mountain sickness. Edward Whymper stated from his own experience of this condition that the abiding symptoms are profound lassitude, intense headache, feverishness, accelerated respiration and occasional spasmodic gulping of air, "just like fishes when taken out of water," palpitation, and tinnitus. The latter two symptoms, no doubt, occur also with great frequency at relatively low levels. It is clear, we think, that flying sickness is not comparable in the strict sense with mountain sickness, in spite of the fact that some of the symptoms are more or less identical. Hitherto we have had little direct evidence of what occurs as the result of rapid transference from high to low altitudes, for the laborious ascent of the mountaineer into rarefied air is very different from a speedy return to normal pressures, while the climb of a flying machine is hardly so rapid as to cause any ill-effect. The pilot who is lifted from his machine, after a fast *vol-plane*, in a semi-conscious condition, falling thereafter into a deep sleep, shows a phenomenon not met with either in mountain sickness or in caisson disease. Nevertheless we believe that some light may be thrown on this by another consideration. In his "Scrambles among the Alps" Whymper states that on one occasion he slipped and fell some 200 feet in seven or eight bounds. Curious as it may appear, though conscious at first, he "was like a patient under chloroform and experienced no pain," albeit badly cut about the head. The bounding through space did not feel disagreeable. He says that in his opinion in no very great distance more consciousness as well as sensation would have been lost, and on this he bases his view that "death by a fall from a great height is as painless an end as can be experienced." In a recent number of a weekly contemporary an interesting note was given on the facts connected with parachute descents of other days, and it was stated that on one occasion, after reaching an altitude of over 12,000 feet in a balloon, the parachutist launched out, but fell at once many hundreds of feet before his parachute opened. It appears that as a result of his rush downwards through space he practically lost consciousness, holding on automatically and regaining his senses an appreciable time after the parachute had attained its normal rate of descent. Evidently there are effects on the functions of the nervous system which are attributable to very rapid descent through space, from low to higher air pressures, no doubt, but in which the alteration of pressure is probably only one factor, and that, perhaps, not the most important. These phenomena are likely to be less rare now than formerly, and they open up a fascinating subject for study, one in which, as in caisson disease, we may hope that exact methods of scientific investigation and control will eventually lead to work becoming safe that was once dangerous, and to the extension of the limits hitherto set to its scope.

THE HEALTH OF THE JAPANESE NAVY.

THE total strength of the personnel of the Imperial Japanese Navy (officers excepted) in 1913, the latest year for which statistics have been issued, was 46,890, being a decrease of 635, as compared with the strength in 1912. The ratio of cases of sickness, that is, of admissions to hospital, was 682·2 per 1000; this being an improvement on the figure for 1912, which was 716·6; and a still greater improvement on the average of 16 years, which was 804·2 per 1000. In our own navy the ratio of admissions averaged 656·6 for the five-year period, 1908–1912. The average number of men daily in hospital has been 22·34 per 1000, compared with the similar figure of 26·97 for the quinquennium in the British Navy. The mortality ratio of the Japanese sailor has been 3·33 per 1000, and the invaliding ratio 18·64 per 1000; the former figure is a most satisfactory reduction on the ratio

for 1912, which was 4·92, and on the 16-year average, which was 5·16 per 1000; but the invaliding shows an increase on the average for 1912, which was 15·15; this in its turn being an increase over the 16-year average, which was 14·88 per 1000. Possibly the examination is more strict now than in former years. In addition to the in-patients in hospital, 29·1 per 1000 of the strength have been under treatment out of hospital, practically the same as in the year preceding (29·98), but a considerable reduction on the 16-year average of 35·2. Among infectious diseases by far the greatest number of admissions were from venereal complaints; of these, there were 3541 cases. Paratyphoid fever comes next with 562 admissions for the A variety, and 160 for paratyphoid B; of true typhoid there were 102 cases. Except for malaria (248 admissions) and dysentery (140) there was no prevalence of any communicable disease; beri-beri caused only 88 admissions. In addition to 4423 conscripts, there were 23,399 volunteers for the Imperial Navy; of these, 9769 passed the medical examination, but 12,717 failed; 933 were prevented from attending by unavoidable circumstances. The large excess of failures over passes points either to defective physique in the class from which recruits are drawn, or to a very stringent requirement on the part of the examining authority. Our own naval statistics do not give the proportion of rejections among recruits, but for the army this proportion has averaged only 321 per 1000. We may, however, be quite sure that the Imperial Japanese Government know what they are about in maintaining a high standard of physical development for the recruit; and if circumstances arise to call for their intervention in the present conflict, we have the greatest confidence in the skill and courage of the personnel, and in the completeness of the organisation and preparedness for action of the Japanese forces, both naval and military.

THE SUPERVISION OF THE PRACTICE OF MIDWIVES.

IN a letter on certain grievances of midwives, printed in another column, a correspondent calls attention to two matters of direct interest to midwives and affecting less immediately a section of the general public. The facts stated by "Fair Play" speak for themselves. With regard to the first question to which he refers, the notifying to medical officers of health or to maternity centres the names of patients who engage midwives for coming confinements, we are disposed to look upon the matter from the point of view of the medical profession, and to ask ourselves what would be the attitude of medical men to a proposal to inflict such an obligation upon them. We conceive that it would be entirely hostile, and that the argument that it would "cut at professional confidence" would be strenuously urged in opposition to it. The practice of midwives is rightly subjected to supervision not imposed where medical men are concerned, but it is desirable that when regulations and provisions for official inspection are introduced they should commend themselves as necessary and should have as little as possible the appearance of being directed against a particular class. Birth registration, the notification of births, and the notification of infectious disease are provided for upon public grounds and without regard to the social or financial position of those in respect of whom notice is given. Notification of a prospective birth if enforced by law upon midwives would be an obligation affecting exclusively women of the class that engages midwives, and its advantages might well be outweighed by the resentment or apprehension that it would evoke as "class legislation." On the other hand, we conceive that there is little to prevent an antenatal notification once declared desirable in the case of midwives being made to apply where medical men are engaged, if merely for the sake of uniformity and to prevent any outcry against "class legislation." Such an innovation would surely need considerable evidence of its desirability before it commended itself to the medical profession. The second matter touched upon by "Fair Play" only concerns the choice of the authority to exercise control over lying-in houses, and we are in accord with his opinion, which we understand to be that in the metropolis uniform administration by the London County Council is preferable to the independent efforts of borough councils working in contiguous areas, and inspired by varying degrees of zeal and intelligence. Those best acquainted with the work done by the London County Council and the metropolitan borough councils would probably agree that the former is the best suited to exercise with firmness and discretion, and at the same time with uniformity, the duties referred to in "Fair Play's" letter. Probably also the London County Council is the best qualified as a central authority to perform the task with economy, without sacrificing efficiency. Rigid economy where the expenditure of money is concerned will be absolutely necessary for public bodies, as well as for individuals, for many years to come.

ACUTE PHARYNGITIS ASSOCIATED WITH ERYSIPELAS.

A CASE of the very rare conjunction of acute pharyngitis with erysipelas, which is of both clinical and pathological interest, is recorded by Dr. H. S. Muckleston in the *Canadian Medical Association Journal* for November, 1915. On March 21st, 1914, Dr. Muckleston saw in consultation a man who had been taken ill on the 17th with what was regarded as an attack of influenza. Pain in the throat and dysphagia began on the 20th. He complained of pain in swallowing, extreme dryness of the throat, and a feeling of something that blocked the passage. Speech was so difficult that he preferred to reply to questions in writing. The tongue was dry and blackened, the soft palate and anterior pillars of the fauces were swollen and deeply congested. The palate was dry and ridged with strings of mucus adhering to it. The uvula was swollen to the size of the little finger with scattered petechiæ and a large bulla near the tip. The tonsils were congested. The posterior pillars of the fauces were swollen and deeply reddened, the swelling extending down the sides of the pharynx to the level of the epiglottis. Except for moderate congestion and slight rounding of the epiglottis the larynx was free. Some scarification of the uvula and the use of a 10 per cent. solution of cocaine gave marked relief, and swallowing became easier. In the evening the patient suddenly became deaf and there was a discharge from the right ear. These symptoms were found to be due to hæmorrhagic bullæ on the meatal wall. One had burst and the other was punctured, and when the meatus was cleared out the membrane was seen to be of normal lustre but slightly injected. There was some

swelling of the auricle. On the next day there were pronounced redness and swelling of the auricle and cheek, but the pharyngitis continued to improve. The inflammation of the skin spread to the scalp, across the head, and down the right side of the neck to the shoulder and arm. There were hyperpyrexia and for some days delirum, but ultimately recovery took place. Reiche and Schomerus have reported a series of 31 cases of pneumococcic infection of the throat, in two of which erysipelas developed. In one case a woman, in the last month of pregnancy, developed pneumococcic pharyngitis with dyspnœa. Labour began on the second day and was completed on the third, when erysipelas began. The child died when 3 days old and the mother died two days later. Pneumococci were found in cultures from bullæ of the skin, in the larynx, the tonsils (here in company with streptococci), and the blood of the child. Delavan has reported three cases of erysipelas of the pharynx or larynx with facial involvement, the redness beginning at the lips or nose. Dr. Muckleston suggests that in his case the path of infection of the skin was through the retropharyngeal and deep cervical glands. Though the streptococcus is accepted as the usual microbe of erysipelas, the power of the pneumococcus to set up what is clinically the same condition has been shown. In the cases in which the period of onset of the erysipelas is reported this was either the third or the fifth day of the pharyngitis. However, Cornil published 50 years ago 18 cases, in half of which the erysipelas was primary and in the remainder secondary. Of the 9 cases of extension from without inwards, 7 were fatal, while in the cases of the reverse 2 were fatal. Delavan quotes Hippocrates, who says: "When erysipelas extends from within outwards it is a favourable symptom, but when it removes from without to the internal surfaces it is a deadly one." In 1895 Sir Felix Semon read a paper at the Royal Medical and Chirurgical Society on "The Probable Identity of the Various Forms of Acute Septic Inflammations of the Throat and Neck hitherto described as Acute Œdema of the Larynx, Œdematous Laryngitis, Erysipelas of the Pharynx and Larynx, Phlegmon of the Pharynx and Larynx, and Angina Ludovici." However, in none of 14 cases reported by him do there appear to have been signs of erysipelas.

OZÆNA AND THE ACCESSORY SINUSES OF THE NOSE.

THE connexion between ozæna and inflammatory processes in the accessory sinuses of the nose has been much debated since 1873, when Mickel very definitely restated the view that ozæna was secondary to chronic suppuration in these cavities. This view has been more recently supported by numerous writers, particularly Grünwald, and is to the effect that both diagnosis and treatment should recognise the primary character of the septic processes in one or other of the accessory sinuses of the nose. The opposite view, however, is not without its supporters, and Dr. S. Wetterstad now brings forward[1] his own extensive experience of the disease to prove that the involvement of these sinuses in ozæna is secondary when it does occur, and is often absent. In the recent literature of ozæna he has found 16 cases in which careful post-mortem examinations were made; in 8 of these the accessory sinuses of the nose were normal, in 8 inflamed. Examining over 1100 records of obduction in cases of all sorts, he finds that one or more of these sinuses showed signs of inflammation in no less than 31 per cent. of the patients. Hence, he argues, it is likely that the connexion between ozæna and infection of the nasal sinuses is commonly accidental, and the infection itself often a terminal event in cases where it does occur. He also points out the difficulty of understanding how it is that an atrophic process like ozæna can be set up by infection from an inflamed nasal accessory sinus in view of the fact that such infections are common and habitually do give rise to hypertrophic inflammations of the nasal mucosa. Again, he considers that the hereditary and familial character of ozæna is in favour of its primary nature, and he emphasises the importance of careful examination of every member of an ozæna family with the construction of the family tree, giving two such trees of his own investigation. The second of these, embracing four generations and 40 individuals, comprises 9 cases of ozæna and 12 of atrophic rhinitis, with a negative Wassermann reaction in the three generations in which it was examined. Finally, Dr. Wetterstad states that he has long been on the look out for a case of inflammation of a nasal sinus leading to ozæna, but has never yet met with one. On the other hand, in 8 out of 88 patients observed by himself he has seen ozæna lead to a secondary infection of one or more of the accessory sinuses. He also considers it possible that both are due to a single process, sinusitis ozænosa, producing a fluid secretion in the accessory cavities of the nose infected, but a dry, crusted, and offensive secretion from the nasal mucous membrane.

[1] Tidsskrift f. d. Norske Laegeforening, Christiania, 1915, xxxv., 977.

EFFECTIVE AND INEFFECTIVE INSECTICIDES.

SOME interesting experiments have been undertaken by Professor Aldo Castellani, on service in the military hospitals at Uskub, Serbia, and Dr. Thomas W. Jackson, acting director of the American Red Cross Sanitary Commission in the same city, as to the efficacy or worthlessness of substances used as insecticides. Their conclusions will prove of practical value to all concerned with hospital management and the care of crowded wards or institutions. In regard to solid and liquid insecticides the substances which they have found to be deleterious to body lice are in the order of their efficiency kerosene, vaseline, guaiacol, anise preparations, iodoform, lysol, cyllin and allied preparations, carbolic acid solutions, naphthalene, and camphor. Pyrethrum, according to these investigators, has a very feeble action on lice, while boric acid, sulphur, corrosive sublimate, and zinc sulphate, when used in powder form, have apparently no action whatever. As regards bed-bugs kerosene, they think, is the best insecticide. Next to it comes guaiacol, one of the most active substances they have tried. Substances which are powerful licecides may have, according to their experience, very little or no action upon bed-bugs and vice versa. Iodoform, for example, kills lice within 10 to 15 minutes, but it has practically no deleterious action on bed-bugs, which may live for more than 24 hours when exposed to it. Iodoform has also very little effect on fleas. On the other hand, pyrethrum has a much more powerful action on bed-bugs than on

lice. In the opinion of the investigators the best insecticide powder for use against lice on a large scale, as among troops and prisoners, is naphthalene. This substance, they state, has a lower licecide action than kerosene, guaiacol, iodoform, and anise preparations, but it has a less displeasing odour than the first three-named and is cheap. In stored blankets and clothing it is also of considerable use, as frequently lice are found upon the blankets laid by throughout the summer. Naphthalene is further useful for its well-known deterrent action upon moths. The investigators finally suggest that for the better class of patients a menthol powder is to be preferred to naphthalene in practice, as its odour is not displeasing, while it is repellant to mosquitoes, as well as to lice and fleas. It is further pointed out that such a powder is especially useful in summer and in hot countries, as it has a cooling effect on the skin and often prevents prickly heat.[1]

ANTHRAX IN THE SHAVING BRUSH.

A SOMEWHAT disturbing account of some cases of anthrax in man traceable to infected shaving brushes appears in our columns this week. Suspicion fell upon a shaving brush in the first instance because at the post-mortem examination it was noted that the small local lesion came well within the individual's shaving area, which covered a larger ground than usual. The clue was followed up and the brush was bacteriologically examined, with the result that it could be definitely stated that it was infected with anthrax. Further inquiry showed that other shaving brushes were grossly infected. Subsequent experiments showed that the infection could be removed to a large extent by thorough washing, but this process would not appear to give absolute security. It is reassuring to learn that on the facts becoming known prompt action was taken to secure, so far as possible, the withdrawal of the brushes from the market. But the circumstances call for a very thorough inspection of the factories where these brushes were made, and careful inquiry, no doubt, will follow as to the source of the infected hairs used for the purpose.

THE BORDET-GENGOU REACTION IN ECHINOCOCCAL DISEASE.

Dr. L. C. Zapelloni has given in *Il Policlinico* for 1915 (Surgical Section) (Nos. 7, 8, 9, 10, and 11) the results of his investigations over a period of five years on the fixation of the complement in all the cases of echinococcal infection admitted into the Umberto I. Hospital and of many of those occurring in the other hospitals at Rome. He also gives an extensive analysis of researches in the same field of study and reported in the literature of the subject during the years 1906 to 1914, and the results of the control experiments made by himself. The number of cases examined for diagnostic purposes and prior to any operative interference was 60, of those examined subsequently 54, and of those free from echinococcal disease 167. In addition, there were in the cases reported by others about 550 in the first group, about 200 in the second, and more than 1600 in the third. These large numbers afford ample material for estimating the fundamental points of practical and theoretical value of the reaction. The details of the test are described minutely by the author, and the reactions showed that there exist in the blood of patients suffering from this disease specific antibodies of the amboceptor type, and they constitute one of the most satisfactory clinical applications of the Bordet-Gengou principle. The reaction was, in fact, positive in 93 per cent. of the cases examined as a means of diagnosis, whether the echinococcus was of the hydatidosus or multilocularis variety, whether the parasites were living or dead, in whatever organs they were situated, and whether the serum was taken during life or after death. The test also proved of value in showing the amount of antibodies present in the serum examined, and in this respect it is interesting to notice that this amount varied, not in relation to the size of the hydatid cyst, but rather with the conditions which facilitated or hindered the passage from the cyst into the circulation of substances with antigenic properties. In fact, such conditions as calcification of the pericyst and prolonged suppuration existed in those cases which gave a negative reaction (7 per cent.). As regards specificity, the reaction was always negative when hydatid infection was absent; even cases affected with closely allied teniæ responded negatively. Moreover, in 0·25 per cent. of reported cases where the reaction was falsely positive the result may be referred to some possible error of technique or to a real infection which was clinically inappreciable. Immediately after operation the reaction was more intensely positive, but the hydatid antibodies disappeared after one to two weeks or more. After six months the reaction was usually negative. The practical value of the test is the more evident when compared with the results of others, such as eosinophilia and precipito-reaction, the former being present in only 60 per cent. of the cases.

AT the next meeting of the Surgical Section of the Royal Society of Medicine on Feb. 2nd, at 5.30 P.M., Dr. F. Hernaman-Johnson will read a paper on the Use of Condensers, and the Diagnosis, Prognosis, and Treatment of Nerve Lesions, and give a demonstration.

THE next meeting of the Medical Society of London will be held on Monday, Jan. 17th, when a discussion on "Gunshot Wounds of the Chest" will be introduced by Colonel Sir John Rose Bradford, F.R.S., R.A.M.C., and Captain H. Morriston Davies, R.A.M.C. Lieutenant-Colonel Hale White, R.A.M.C., and others will take part in the discussion. Fellows and others desirous of taking part in the discussion are requested to communicate with the honorary secretaries or the registrar, 11, Chandos-street, W.

THE LATE LORD ARMITSTEAD AS A HOSPITAL BENEFACTOR.—At the quarterly meeting of the governors of the Dundee Royal Infirmary held on Dec. 12th the chairman referred to the loss sustained by the death of Lord Armitstead, since 1869 one of the vice-presidents, who had long been a true friend of the infirmary. In 1866 Lord Armitstead gave £1000 towards the treatment of fever cases, and in 1883, when the children's ward was opened, he generously contributed a further £500 towards the additional expenditure. In 1899 he presented the directors of the institution with a sum of £2000 as a mark of confidence, and again later in the same year he gave £500 towards the year's deficit. The infirmary, along with the sanatorium and convalescent home, will benefit largely through the provisions of his will.

[1] The results of this practical investigation were published in the Journal of Tropical Medicine and Hygiene, Nov. 15th, 1915, and the report has since been printed in pamphlet form by Messrs. John Bale, Sons, and Danielsson, Limited, of Oxford House, 83-91, Great Titchfield-street, Oxford-street, W.

SANITATION IN BILLETS AND CAMPS.

By ADAM WHITE, M.B., CH.B., D.T.M. & H. EDIN., D.P.H. CAMB.,
LIEUTENANT, R.A.M.C. (T.); OFFICER COMMANDING SANITARY SECTION, 21ST NORTH MIDLAND DIVISION.

BILLETS.

As the billeting of troops is a matter which brings the civil and military authorities into specially close relationship, and as considerable bodies of soldiers are liable to be quartered in billets from time to time, the subject of the sanitary supervision of such abodes requires the earnest consideration of those charged with the conservation of the public health in general.

The practice of billeting troops in private houses is a very ancient one, and references to it are found in petitions to the Crown in the Tudor and Stuart periods, in the Petition of Right (1628), and in the Bill of Rights (1689). To come to more modern times, the Army Act of 1909 provided that, in the event of the Territorial Force being called up, the Crown should have power, by the promulgation of an Order in Council, to declare that a state of emergency had arisen necessitating extensive billeting operations. The relative Order in Council was made on August 4th, 1914.

In pursuance of this Order any general or field officer in any part of the United Kingdom may issue a billeting demand upon the civil authority of the district in which he desires to have troops billeted. In practice these operations are generally initiated through the agency of the police. Occupiers of licensed premises, of public buildings and private dwelling-houses, of warehouses, barns, and stables, as well as owners of unoccupied premises, are liable to provide billets. But it is expressely enacted that the convenience of the various persons liable must be considered, and any person who believes himself aggrieved may have recourse to a court of summary jurisdiction.

Varieties of Billets: Accommodation in Various Areas.

Speaking generally, we may say that there are three varieties of billet, viz.:—

1. The soldier is provided with lodging, attendance, light (the specified illuminant being candles), fires, suitable utensils for cooking his rations, and also with sundries such as salt, &c. Rations in kind are provided by the military authorities, or a money allowance in lieu of rations is issued to the soldier, who then buys his own food. The price paid for this form of billet is 9*d.* for one soldier and 6*d.* for each additional soldier. It is found in practice that all cooking is done for the soldier by the housewife, although it is not incumbent upon her to undertake this duty. Perhaps her well-recognised readiness to play the rôle of cook may be explained in part by the chances of material gain which will accrue, and in part by a quite understandable desire to save herself the trouble of cleaning up her kitchen after its use by those who have little experience in the culinary art.

2. The soldier is provided with lodging, &c., and also with meals. The price for lodging and attendance is the same as that specified above, the meals being paid for according to a tariff.

3. In this form of billet the men are put up in unoccupied houses and other buildings, and it is only the actual house-room which is provided. For this bare accommodation the sum of 1*d.* per night per man is paid.

The number of troops which a given area can accommodate or absorb is generally calculated as being so many per unit of population, but naturally the actual figure varies much with the character of the houses in the area and according to the economic status of the inhabitants and the industries which they carry on. In addition, the presence or absence of absolute or relative overcrowding has an important bearing upon the subject. It is generally held that billets with subsistence can be provided for a period of one week in the proportion of two soldiers to one of population, but in areas which have been war-swept subsistence will be specially difficult to obtain. Billets without subsistence can, as a rule, be obtained in the case of rich agricultural districts on a basis of 10 men per inhabitant, and in the case of good-class industrial towns on a basis of five to six men per unit of population. As the density of population increases, the absorbing capacity naturally diminishes, and the figures quoted will be found to be impossible in areas in which the population is closely aggregated and in which a poor class of house is the rule.

Sanitation in Billets.

So far as sanitation is concerned, the two varieties of billet first named may be considered together. When placed in these billets the soldier is living under somewhat similar general conditions to those obtaining in the case of the ordinary lodger or boarder, and he will be subjected to the same risks and vicissitudes. There is a general tendency to overcrowd billets. This is due partly to a desire on the part of the men to be with their friends and partly to the wish of the commanding officer to keep his personnel together as much as possible. It is essential that this tendency should be counteracted, and it may be stated that 40 square feet of floor space should be regarded as a minimum in the sleeping-room. Taking the effective height of the room as being 8 feet, the above allowance of floor space will give a cubic allowance of 300 odd feet. On account of the modesty of this requirement of air space it is essential that the rooms occupied should be well ventilated, and for this reason no rooms in which the windows do not open at least at the top and to a sufficient extent should be used for billeting purposes.

As it is in the best interest of all concerned to conserve the health of the troops, every possible discretion should be exercised by those responsible for the selection of billets. Information regarding houses which for any reason are unsuitable for the reception of soldiers should be obtained from the civil authorities or from the responsible officers of divisions which have previously occupied the area, and such houses should be sedulously avoided. Houses which already have their full complement of inhabitants, houses in which cases of infectious disease exist, houses the inhabitants of which are notoriously uncleanly or otherwise undesirable, and houses in which the general sanitation is below par come within this category.

In the case of the third-named variety of billet the conditions met with are altogether unusual in that the men are placed in domiciles which are totally unfurnished and which were intended to house a number of inmates much less than the number of soldiers placed in them for billeting purposes. For example, we may have a house which under ordinary circumstances would be called upon to contain 10 or 12 persons used for the purpose of

billeting 30 or 40 soldiers. In such a case as this a severe strain is placed upon the kitchen, lavatory, and water-closet accommodation.

Although the commander of every unit is responsible to superior authority for the sanitary condition of any area which his unit may occupy, and although officers are enjoined to visit the billets of their men at irregular intervals at least once by day and once by night, it is highly desirable that all houses used as billets should be systematically inspected and supervised by the officer commanding the Divisional Sanitary Section. As soldiers when living in billets are in more intimate domestic relationship with the civil population than is the case in other methods of quartering, it is of great importance that the local medical officer of health should have opportunities afforded to him for exercising his general public health functions. In connexion with the inspection and supervision of billets we may now briefly consider some of the more important points which demand attention.

Inspection and Supervision of Billets.

General cleanliness of billets is absolutely essential for the prevention of disease and for the maintenance of military discipline. Great care should be taken to ensure that the premises are kept thoroughly clean and tidy. All bedding should be taken out and exposed to the fresh air at least every other day, and precautions should be taken to ensure the earliest possible detection of verminous infestation. The rooms occupied, if uncarpeted, should be scrubbed twice per week, and oftener when the weather is wet. The men themselves should undertake this work.

When making inspections attention should be paid to the state of the cooking utensils, as their condition is a useful index of the general condition of the household in the matter of domestic cleanliness. In addition, the available cooking facilities and the accommodation provided for the storage of food demand attention. Generally speaking, the cooking arrangements are quite satisfactory in the majority of houses, but it is unfortunately the case that the same reassuring statement cannot be made with reference to the food stores of the average house.

When men are receiving their rations in kind (which is the most common method of rationing adopted) it is seldom that more than one day's rations are issued at once, so that there is no great amount of food on the premises at any one time. But even admitting that this is true, it is undoubtedly the case that when three or four men are billeted in the average four-roomed occupied house, or when 30 or 40 men are quartered in an empty house, the larder accommodation is severely taxed. In both cases great care should be taken to see that the available food-storage space is used to the greatest possible advantage, and that miscellaneous domestic articles are not allowed to encroach upon a part of the house which is not intended for their reception. In the case of the empty house billet, something may be done to ensure proper housing of the meat by the provision of improvised meat safes. These can be readily constructed from wooden bars and fly-proof wire-gauze.

Disposal of Garbage.

The provisions for garbage removal should be carefully inspected. In many small towns suitable receptacles are not provided, and the refuse is not removed at sufficiently frequent intervals. These defects should be remedied as far as possible.

The latter condition (that of insufficiently frequent removal) can generally be overcome by methods adopted in consultation with the medical officer of health. Nuisance is specially apt to arise from this cause in the case of empty houses which are being used for billeting purposes, as the domestic refuse resulting from the feeding and housing of 40 or 50 men is considerable. The difficulty may be rendered somewhat less pressing by teaching the cooks to burn as much of the refuse as the kitchen fire will deal with.

While it is not always possible to have the ideal type of refuse receptacle installed, and while it may in many cases be necessary to put up with makeshifts and to improvise from materials which lie to one's hand, an endeavour should be made to have the receptacles of suitable size and shape, watertight, and covered.

The refuse should be removed at least once every other day, and in the case of the empty house variety of billet the collection should be made every day. In small townships with primitive methods of scavenging such regular and frequent collection is sometimes difficult to obtain, but regular and frequent removal should be aimed at, and in all possible cases daily removal should be realised. Failing efficient scavenging arrangements, all garbage should be burnt in some form of incinerator erected in the garden or yard of the house. This, of course, cannot be done in densely populated areas, but in such areas it is generally not required.

Disposal of Excreta.

The congregating together in one house of a comparatively large number of men raises difficulties with regard to the disposal of fæces and urine. One, or at most two water-closets form the complement of the average house, and this provision is often not sufficient when the house is being occupied as a billet. Additional accommodation must be provided, and the exact form which this added accommodation will take must vary in different cases.

Additional water-closets cannot, as a rule, be provided, and even if it were possible to provide such it is doubtful if this form of closet is the best for the purpose in view, for we must remember that the occupation is in all probability to be purely temporary, and, moreover, a water-closet provides temptations for its use as a means of getting rid of materials which it is not, in the ordinary course of events, intended to deal with. As a rule, it may be said that anything in the nature of the conventional earth-closet is not a success when this form of convenience is to be used by soldiers.

Undoubtedly, the best form which this additional accommodation can take is that of a bucket latrine. The exact method of working bucket latrines will be discussed later in the remarks relating to camp sanitation. Suffice it for the present to say that they should be provided on a scale of 10 per cent. of strength. The best results are obtained when the buckets are placed in some form of small shed constructed in the garden of the house. Most large empty houses which are used for billeting purposes have comparatively large gardens, so that little difficulty is experienced in this matter, but it may be laid down as a general rule that a house which is deficient in water-closet provision, and which does not possess sufficient curtilage to accommodate a proper latrine shed, should not be used for billeting troops.

(To be concluded.)

MEDICINE AND THE LAW.

Inquests and the Time Question.

AN inquest was held recently at Hurstpierpoint upon the body of an elderly lady, who, having broken one of her thigh bones by falling in her room on Oct. 11th, died on Dec. 15th. It was stated that the deceased made favourable progress until the middle of November when senile changes began to show themselves, followed by death, as mentioned above. At the inquest, no doubt quite properly held, the coroner was asked within what period after an accident or injury to which a death might be traced it was necessary to hold an inquest. His reply was to the effect that there was no limit, and that the fact that no one could be charged with murder or manslaughter more than a year and a day after the occurrence causing the death had nothing to do with the situation, adding that he did not think he would hold an inquest if death occurred 20 years after an accident. In this last observation we concur, for it would be waste of time and money to hold an inquiry which could have no result in any case so far as the perpetrator of any wrongful act was concerned and which would be unlikely to lead to any definite result of any kind. In most cases the year-and-a-day limit will be sufficient, and the coroner upon such occasions might in his discretion, and unless there were any cogent reasons for holding an inquest, decide that the evidence pointing to an "unnatural" death was not sufficient to necessitate an inquiry. He would, of course, be governed by circumstances, by the medical evidence at his disposal, and by the consideration of possible facts rendering an inquest desirable upon public grounds. Inquests are generally repugnant to the feelings of surviving relatives, and although we have no definite statistics in support of our opinion, we believe that coroners do at times exercise a discretion such as we have suggested. We cannot, for example, believe that a coroner in Cumberland would hold an inquest and bring up witnesses from Cornwall because he was told that the death of a person whose body lay within his jurisdiction was probably accelerated by an accident which the deceased met with in the latter county several years before death actually took place. The law may be as stated by the coroner at Hurstpierpoint, and may enable an inquest to be held after any lapse of time, but we question the necessity for such a course in the public interest except on very rare occasions when the year-and-a-day limit has been exceeded. We might also suggest that if such inquests are seldom or never held it is because although the medical evidence might reasonably attribute death to an accident after a considerable time, such a death would not be in the ordinary acceptation of the term an "unnatural" one. It certainly would not be a "violent" death however it was caused. It is the safest course for a medical practitioner to report a case which has been under his care, when the responsibility rests upon the shoulders of the coroner. We refer to occasions where the medical man is satisfied that but for an accident, or some such cause, his patient would have been alive, and medical evidence to that effect can be given.

Poor-law Guardians and Vaccination.

In Ireland the duty of enforcing the vaccination laws devolves on the boards of guardians, and for the past few years, as the result of an antivaccination campaign, some of the boards have been deliberately avoiding their obligation in the matter. As a result the proportion of primary vaccinations to births has fallen in the past ten years from nearly 90 per cent. to 65 per cent. The Local Government Board at first contented itself with issuing occasional circulars. More recently, recognising the dangerous conditions that were arising through neglect of vaccination, the Board has shown some disposition to compel boards of guardians to carry out the law, and a few days ago application was made to the King's Bench to make absolute a conditional order of mandamus against the Letterkenny guardians. The Lord Chief Justice, in the course of his judgment, said that the subject of compulsory vaccinating first came formally before the guardians at their meeting on June 23rd, 1913, when a resolution was adopted that the matter of vaccination be left an open one and that no prosecution be instituted in case of non-vaccination. The affidavit of their clerk said that the guardians were informed that they were the final and ultimate tribunal to decide as to the enforcement of the provisions of the Vaccination Acts within their union. Whether they were so or not it was for the court now to decide. Section 10 of the Act of 1879 provided "that the guardians of any union in Ireland may direct proceedings to be instituted for the purpose of enforcing obedience to the provisions of the Vaccination (Ireland) Acts." The first question for the court was whether Section 10 was or was not mandatory in its operation. It provided, it was true, that the guardians "may" direct proceedings to be instituted, and the guardians contended that this language gave them a discretion in the matter. But it was settled law that provisions in a statute, though of a permissive character, might impose a duty. His lordship cited some cases in support of this canon of construction with the view of showing it was well established and could not now be questioned. His lordship was clearly of opinion that the tenth section of the Act of 1879 was mandatory in its character, and that it was the duty of the guardians—a duty which could be enforced by mandamus—to take steps to enforce the compulsory provisions of the Vaccination Acts within their district. His lordship came further to the conclusion that the Local Government Board had a locus standi to interfere where the guardians were not carrying out their duties under the Vaccination Acts, and that it was a proper relator in this proceeding. The conditional order for a writ of mandamus should, therefore, be made absolute. His lordship added, with regard to the question of costs, that as this was the first occasion upon which it had been decided in Ireland that the duty of enforcing the Vaccination Acts was mandatory upon the boards of guardians, and as the Letterkenny guardians appeared to have adopted the course they did in the *bonâ fide* belief that they legally had a discretion in the matter, he did not think that they ought to be required to pay the costs personally. "But," added his lordship, "I should like it to be understood that for the future, if the order of the court in the present case stands, guardians who persistently refuse to enforce the Vaccination Acts within their districts will do so at the peril of being obliged personally to pay the costs of proceedings to compel them to discharge their duty in this respect." Mr. Justice Madden and Mr. Justice Boyd concurred.

The Second Conviction of an Impostor.

Charged under the name of H. J. Herring, a person without medical qualifications was sentenced to four years' penal servitude at a recent sessions of the Central Criminal Court for feloniously giving death certificates in four cases. He was also indicted for bigamy. The prisoner had personated Mr. E. Ken Herring, a medical man practising in New South Wales, and having represented himself to be Mr. E. K. Herring to a medical agency in London obtained the post of locum tenens during the absence of Mr. W. J. Deighan upon war service. Among the patients whom he attended four died and the prisoner signed the certificates of the cause of death. He afterwards was for a time locum tenens to a medical practitioner at Cambridge and was arrested while acting in a similar capacity in Lancashire, where he had been in two posts as locum tenens. He had given death certificates in at least 12 instances besides those mentioned above. Inquiry by the police had shown that several years ago he had been sentenced to penal servitude for five years for manslaughter, having on that occasion represented himself to be Mr. J. B. Hoffmeister, a medical man who, in fact, was practising in the Isle of Wight. He had acted as an assistant to druggists, and having been married in 1906 and become the father of four children, had gone through the ceremony of marriage with a second woman in 1910, perfectly well knowing that his wife, with whom he was in communication, was alive. The war affords an exceptional opportunity to dangerous imposters of this class, but the fate of this particular scoundrel should be a warning to others. Discovery and punishment usually supervene, and nine years of penal servitude must weigh heavily against brief periods of success, the comparative ease of which must be marred by dread of detection and arrest.

THE Royal Dental Hospital, Leicester-square, W.C., has received a donation of £2000 from the trustees of the late Miss Harker-Smith.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE undermentioned have been granted commissions as Surgeons for temporary service in His Majesty's Fleet:—John Duffin (dated Dec. 14th). Harry Forrest Stephen (dated Dec. 17th). Hubert Musgrave Oddy (dated Dec. 18th). Arthur Campbell Brown and Francis Temple Grey (dated Dec. 21st). James Bertie Simpson and George William Marshall Findlay (dated Dec. 22nd). Denys Mavesyn Percival Whitcombe (dated Dec. 23rd).

ARMY MEDICAL SERVICE.

Major (temporary Lieutenant-Colonel) John G. Bell relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services (dated Nov. 18th).

Temporary Colonel George L. Gulland relinquishes his commission (dated Dec. 11th).

ROYAL ARMY MEDICAL CORPS.

Temporary Lieutenant-Colonel Sir Ronald Ross, K.C.B., relinquishes his commission (dated Nov. 29th).

Lieutenant-Colonel D. Macauley, South African Medical Corps, to be temporary Lieutenant-Colonel (dated August 11th).

Major Sir Edward S. Worthington, C.M.G., M.V.O., to be temporary Lieutenant-Colonel whilst Commandant, Officers' Convalescent Home, Cimiez (dated Nov. 1st).

John Charles Grant Ledingham to be temporary Lieutenant-Colonel (dated Dec. 8th).

Major H. Hemsted, South African Medical Corps, to be temporary Major (dated August 13th).

The undermentioned to be temporary Captains:—

Dated Dec. 1st: Frederick William Twort, Hugh Dickie, Thomas Gillman Moorhead, and temporary Captain George Beley, from the York and Lancaster Regiment.

The undermentioned temporary Lieutenants to be temporary Captains:—

Dated August 15th: William L. G. Davies.
Dated Sept. 10th: William W. Deans.
Dated Sept. 26th: Ernest R. G. Greville.
Dated Oct. 1st: David Thomson.
Dated Oct. 2nd: John R. P. Allin.
Dated Oct. 3rd: Geoffrey Hadfield.
Dated Oct. 5th: James H. Aikman and William C. Jardine.
Dated Oct. 7th: William H. Laslett and Malcolm A. MacDonald.
Dated Oct. 10th: Thomas Fehily, Mark Bates, James A. Glover, Norbert Reader, Wilfred V. Macaskie, George Jackson, Edgar A. Pearson, William J. Nisbet, and Michael J. Murray.
Dated Oct. 11th: Frederick W. McMillan.
Dated Oct. 12th: Trevor O. Williams.
Dated Oct. 19th: John E. Cox.
Dated Oct. 21st: Charles J. Kelly, David W. Reid, Charles H. Thompson, and Richard Williams.
Dated Oct. 22nd: Trevor R. Snelling.
Dated Oct. 24th: Roland R. Wettenhall.
Dated Oct. 28th: Martin W. Littlewood.
Dated Nov. 11th: John I. Russell.
Dated Nov. 17th: John B. Fisher.
Dated Nov. 23rd: Basil C. Ashton.
Dated Nov. 24th: Crawford Lundie and Walter Amsden.
Dated Nov. 25th: Frederick Buick McCarter.
Dated Nov. 27th: Charles A. Kenny.
Dated Dec. 3rd: Norman F. Hallows.
Dated Dec. 21st: Alexander Gibson, Cyril Wace, and Eric Bellingham Smith.
Dated Dec. 22nd: R. W. Gemmell.

The undermentioned to be temporary Lieutenants:—

Dated Oct. 14th: James Roberts Boyd.
Dated Nov. 18th: John Anderson.
Dated Nov. 27th: Edward Sutcliffe, John Unsworth, Owen David Baker Mawson, William Bannerman, Harold Pace Gibb, Gerald Francis Bird, and Cyril Henry Edwards.
Dated Nov. 28th: Cuthbert Edmund Arnold Huddart.
Dated Nov. 29th: Robert Blackie Austin, William Ernest Hills, Joseph Scott Taggart, Thomas Ewing, David McMurray Dickson, and Robert Anderson.
Dated Nov. 30th: Robert Henry Shepard, Ian Finlayson MacKenzie, and William Parker.
Dated Dec. 1st: William Bligh, James Robert Craig, Thomas Christopher Harke, Robert James Bethune, Neville Henry Austin, John Farquhar MacLeod, Thomas Herbert Oliver, Basil Edward Spurgin, William Stirling, Michael Gladstone Pettigrew, James Garden Gray, Richard Harding Bremridge, Reginald Henry Urwick, Arthur Edwin Fiddian, William Maxwell Penny, John Bowen-Jones, William Edward Barker, Harold Rosser, Styleman Walford, Rupert John Vernon, Algernon James Beadel, James Arthur Lowry, Archibald Campbell, John Cayley Padwick, John Alban Kendall Griffiths, Samuel Robert Dudley, Arthur William Senior, Charles Hornan Givan Ross, William Wrigley Stacey, Leslie Muir Smith, George Bent Buckley, Gruner Stowell, Thomas Henry Clarke, Philip Verdon, Percy Lyndon Moore, John William Jackson, Thomas Munn Body, Charles Claud Twort, Alexander Gordon Peter, Hugh Lowrie Askham, Arthur William Wilcox, George Donaldson Edie Tullis, Charles Henry Ferguson, Walter Crabtree, James Williamson Tocher, John Rawlings Rees, Geoffrey Dowson Gripper, Thomas William Earl Moreton, Cyril Hamilton Phillips, James Aspinall Marsden, Hubert Cyril Willoughley Allott, Alexander William Allan, John Welsh, John Pender, Hugh Miller, Thomas Smyth, William James Edgar, Frederick James Strachan, Herbert Hargreaves, Archibald Davidson, Harold Edward Dyson, Francis Percy Young, David Kennedy, Edward Hesterlow, Arthur Lonsdale McCreery, William Darlington, Harold Oscar Gough, James Douglas Cooke, and Robert Graham Brown.
Dated Dec. 2nd: William Bow Tannahill, Kenneth Pretty, John Ross, and Oswald Vincent Burrows.

The undermentioned relinquish their temporary honorary commissions on ceasing to be employed with No 7 British Red Cross (Allied Forces Base) Hospital:—Dated Dec. 7th: Lieutenant-Colonel W. E. Miles and Major H. D. Gillies, and Captains R. G. Murray, A. E. Forester, J. S. Burn, and J. E. Adler.

Temporary Honorary Lieutenant B. G. Klein, having ceased to be employed with the Welsh Hospital, Netley, relinquishes his commission.

The undermentioned relinquish their commissions:—

Dated Nov. 8th: Temporary Captain Guy A. C. Mitchell.
Dated Nov. 24th: Temporary Lieutenant James Matheson.
Dated Dec. 2nd: Temporary Captain William P. Morgan.

The undermentioned temporary Lieutenants relinquish their commissions:—

Dated Oct. 24th: David H. Collingham.
Dated Nov. 17th: Bernard Francis.
Dated Dec. 7th: Andrew B. Douglas.
Dated Dec. 13th: Ninian E. M. Home-Hay (on account of ill-health).
Dated Dec. 22nd: John Hegarty.

Temporary Lieutenant Joseph Brewer is placed temporarily on retired pay on account of ill-health (dated Nov. 14th).

The undermentioned to be temporary Honorary Lieutenants:—

Dated Nov. 29th: Philip Hewer Wells and Eric Gordon Dingley.
Dated Dec. 1st: John Nissen Deacon.
Dated Dec. 6th: George Charles Berg and Charles Hugh Colclough Byrne.
Dated Dec. 8th: Lancelot George Jacob and Samuel Reginald Prall.
Dated Dec. 9th: William Thomas.

Henry Adrian Fitzroy Wilson to be temporary Honorary Lieutenant whilst serving with the British Red Cross Hospital, Netley (dated Dec. 25th).

Temporary Honorary Lieutenant James P. S. Dunn, having ceased to serve with the British Red Cross Hospital, Netley, relinquishes his commission (dated Dec. 6th).

Oversea Contingents (Canadian Army Medical Corps).—N. H. Ferguson to be temporary Captain (dated Dec. 19th).

The undermentioned Lieutenants of the Canadian Army Medical Corps to be temporary Lieutenants:—

Dated Nov. 23rd: Ralph Thomson MacLaren, Edward Hiram Freeman, Ernest Samuel Moorhead, Alex Boyd Roberts, James Bryce Brown, Charles Stuart Wynne, Harry Whittaker Paddell, Ernest Rommel, James Douglas Shields, Archibald Forbes Laird, and William Laurence Evans.

TERRITORIAL FORCE.

Royal Army Medical Corps.

South Midland Mounted Brigade Field Ambulance: Lieutenant Frank Smith to be Captain.

Highland Field Ambulance: To be Captains: Lieutenant Benjamin J. Alcock and Lieutenant John G. Anderson.

Home Counties Field Ambulance: To be Captains: Captain Joseph E. Ryan, from London Field Ambulance, and Lieutenant Milward C. Hayward.

Lowland Field Ambulance: Lieutenant William B. Stewart to be Captain.

South Midland Field Ambulance: Frederick Alexander James Mayes to be Lieutenant.

Northern General Hospital: Lieutenant-Colonel Joseph Faulkner Dobson is placed on temporary retired list on account of ill-health. To be Captains: Lieutenant Thomas S. P. Parkinson, Lieutenant William A. Slater, and Lieutenant Harold D. Pickles.

East Anglian Casualty Clearing Station: Lieutenant William J. Deighan to be Captain.

East Lancashire Casualty Clearing Station: Lieutenant Edward A. Williams to be Captain.

South-Western Mounted Brigade Field Ambulance: Lieutenant John H. Cumming to be Captain. James Woodman Astley Cooper to be Lieutenant.

Southern General Hospital: Lieutenant Aubrey Radford to be Captain. To be Lieutenants: Thomas Sidney Stafford (late temporary Lieutenant, R.A.M.C.) and Allan Nathaniel Worsley. Major R. L. Rutherford resigns his commission on account of ill-health.

West Lancashire Field Ambulance: The undermentioned Lieutenants to be Captains: James P. Thierens and William F. Young. To be Lieutenants: Albert Victor Glendenning and Alan Hargrave Pinder.

West Lancashire Casualty Clearing Station: Duncan Francis Hunter to be Lieutenant.

South Midland Casualty Clearing Station: Guy Hannah Kirby to be Lieutenant.

Western General Hospital: Lieutenant Frank Chadwick to be Captain.

London Sanitary Company: Douglas Porter to be Lieutenant.

East Anglian Field Ambulance: Lieutenant Saville J. Fielding to be Captain.

East Lancashire Field Ambulance: To be Lieutenants: Charles Wainwright Fort and Arthur William Berry.

Eastern General Hospital: Lieutenant Ernest F. Ballard to be Captain.

Highland Casualty Clearing Station: To be Captains: Lieutenant John Alexander Innes and Lieutenant John Dow.

Supernumerary for Service with the Officers Training Corps: Lieutenant John P. Kinloch to be temporary Captain whilst serving with the Aberdeen University Contingent, Senior Division, Officers Training Corps.

Attached to Units other than Medical Units.—To be Captains: Lieutenant George J. E. Trotter and Lieutenant Gerald Stephen Hughes. To be Lieutenants: James Burnet Smith and James Morrison Orr.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 largest English and Welsh towns with populations exceeding 50,000 persons at the last Census, 6960 births and 5462 deaths were registered during the week ended Saturday, Dec. 18th, 1915. The annual rate of mortality in these towns, which had been 16·7, 18·5, and 17·1 per 1000 in the three preceding weeks, fell in the week under notice to 15·7 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of 1914. During the first 11 weeks of last quarter the mean annual death-rate in these towns averaged 15·4, against a corresponding rate of 16·1 per 1000 in London. The annual death-rate for the week under review ranged from 5·1 in Edmonton, 6·6 in Coventry, 6·9 in Swindon, and 8·1 in Willesden and in Swansea, to 20·0 in Liverpool, 20·1 in Dudley and Blackpool, 20·6 in Bootle, 21·5 in Sunderland, and 21·7 in Leicester.

The 5462 deaths from all causes were 492 fewer than the number in the previous week, and included 298 which were referred to the principal epidemic diseases, against numbers declining from 373 to 338 in the three preceding weeks. Of these 298 deaths, 75 resulted from measles, 68 from infantile diarrhœal diseases, 65 from diphtheria, 60 from whooping-cough, 19 from scarlet fever, and 11 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases did not exceed 0·9, or 0·1 per 1000 less than in the previous week. The deaths attributed to measles, which had been 70, 93, and 81 in the three preceding weeks, fell to 75, and caused the highest annual death-rates of 1·1 in Bristol, 1·3 in Grimsby and in Swansea, 1·8 in Bury, 1·9 in Burnley, 2·0 in Swindon, 3·8 in Leicester, and 4·1 in Gloucester. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 125, 98, and 103 in the three preceding weeks, fell to 68, and included 14 in London, 6 in Manchester, and 5 each in Birmingham and Leicester. The fatal cases of diphtheria, which had been 72, 62, and 74 in the three preceding weeks, fell to 65, of which 25 were registered in London and 3 each in Stoke-on-Trent and Bolton. The deaths attributed to whooping-cough, which had been 57, 63, and 47 in the three preceding weeks, rose to 60; 15 deaths were recorded in London, 6 each in Liverpool and West Ham, and 3 each in Birmingham, Manchester, and Gateshead. The deaths referred to scarlet fever, which had been 34, 20, and 22 in the three preceding weeks, fell to 19, and included 5 in London and 3 in Stoke-on-Trent. The fatal cases of enteric fever, which had been 15, 12, and 11 in the three preceding weeks, were again 11, of which 3 occurred in London.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had declined from 3110 to 2738 in the seven preceding weeks, further fell to 2582 on Dec. 18th; 245 new cases were admitted during the week, against 318, 278, and 282 in the three preceding weeks. These hospitals also contained on the date mentioned 1550 cases of diphtheria, 53 of enteric fever, 25 of measles, and 10 of whooping-cough, but not one of small-pox. The 1416 deaths from all causes in London were 132 fewer than the number in the previous week, and corresponded to an annual death-rate of 16·3 per 1000. The deaths referred to diseases of the respiratory system, which had been 398, 516, and 438 in the three preceding weeks, further declined to 357 in the week under notice, but were 44 in excess of the number registered in the corresponding week of the previous year.

Of the 5462 deaths from all causes in the 96 towns, 243 resulted from different forms of violence and 461 were the subject of coroners' inquests, while 1521 occurred in public institutions. The causes of 36, or 0·7 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Manchester, Leeds, Bristol, West Ham, Bradford, Hull, and in 71 other smaller towns. Of the 36 uncertified causes, 9 were registered in Birmingham, 6 in Liverpool, and 2 each in Bootle, St. Helens, Preston, and Gateshead.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,345,500 persons at the middle of 1915, 990 births and 888 deaths were registered during the week ended Saturday, Dec. 18th. The annual rate of mortality in these towns, which had been 22·7, 22·4, and 18·7 per 1000 in the three preceding weeks, rose to 19·7 per 1000 in the week under notice. During the first eleven weeks of last quarter the mean annual death-rate in these towns averaged 18·0, against 15·4 per 1000 in the large English towns. Among the several towns the death-rate during the week ranged from 12·7 in Kilmarnock, 12·9 in Clydebank, and 13·8 in Motherwell, to 26·6 in Perth, 28·0 in Greenock, and 28·9 in Falkirk.

The 888 deaths from all causes were 47 in excess of the number in the previous week, and included 64 which were referred to the principal epidemic diseases, against 87 and 77 in the two preceding weeks. Of these 64 deaths, 24 resulted from measles, 14 from diphtheria, 11 from scarlet fever, 8 from infantile diarrhœal diseases, and 7 from whooping-cough, but not one from enteric fever or from small-pox. The mean annual death-rate from these diseases was equal to 1·4, against 0·9 per 1000 in the large English towns. The deaths attributed to measles, which had been 29, 31, and 24 in the three preceding weeks, were again 24 in the week under review, and included 6 each in Edinburgh and Greenock, and 5 each in Glasgow and Hamilton. The deaths referred to diphtheria, which had been 15, 21, and 19 in the three preceding weeks, fell to 14, of which 4 occurred in Edinburgh, 3 in Aberdeen, and 2 each in Greenock and Kirkcaldy. The fatal cases of scarlet fever, which had been 15, 11, and 20 in the three preceding weeks, fell to 11, and included 6 in Glasgow and 3 in Aberdeen. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 15, 17, and 12 in the three preceding weeks, further declined to 8, of which 3 were registered in Glasgow. The 7 deaths referred to whooping-cough were 4 in excess of the average in the earlier weeks of the quarter, and included 3 in Glasgow and 2 in Dundee.

The deaths referred to diseases of the respiratory system, which had been 322, 291, and 211 in the three preceding weeks, fell to 208 in the week under notice, but were 39 above the number registered in the corresponding week of the previous year. The deaths from violence numbered 38, against 34 and 17 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland, with an aggregate population estimated at 1,212,380 persons at the middle of 1915, 508 births and 516 deaths were registered during the week ended Saturday, Dec. 18th. The annual rate of mortality in these towns, which had been 20·1, 21·8, and 20·0 per 1000 in the three preceding weeks, rose to 22·2 per 1000 in the week under notice. During the first eleven weeks of last quarter the mean annual death-rate in these towns averaged 18·3, against corresponding rates of 15·4 and 18·0 per 1000 in the English and Scotch towns respectively. The annual death-rate for the week mentioned was equal to 24·9 in Dublin (against 16·3 in London and 19·1 in Glasgow), 23·0 in Belfast, 23·8 in Cork, 21·5 in Londonderry, 9·5 in Limerick, and 22·8, in Waterford, while in the 21 smaller towns the mean death-rate was 17·3 per 1000.

The 516 deaths from all causes were 52 in excess of the number in the previous week, and included 46 which were

referred to the principal epidemic diseases, against 50 and 37 in the two preceding weeks. Of these 46 deaths, 18 resulted from measles, 10 from infantile diarrhœal diseases, 8 from whooping-cough, 7 from scarlet fever, 2 from enteric fever, and 1 from diphtheria, but not one from small-pox. The mean annual death-rate from these diseases was equal to 2·0, against corresponding rates of 0·9 and 1·4 per 1000 in the English and Scotch towns respectively. The deaths attributed to measles, which had been 10, 15, and 14 in the three preceding weeks, rose to 18, of which 11 were registered in Dublin and 7 in Belfast. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 17, 12, and 9 in the three preceding weeks, were 10 in the week under review, and included 8 in Dublin. The fatal cases of whooping-cough, which had been 9, 11, and 5 in the three preceding weeks, rose to 8, and comprised 4 in Belfast, 3 in Dublin, and 1 in Drogheda. The deaths attributed to scarlet fever, which had been 10, 7, and 4 in the three preceding weeks, rose to 7, of which 4 occurred in Belfast and 3 in Dublin. The fatal cases of enteric fever were registered in Dublin and Londonderry and that of diphtheria in Belfast.

The deaths referred to diseases of the respiratory system, which had been 117, 144, and 122 in the three preceding weeks, were 121 in the week under notice. Of the 516 deaths from all causes, 142, or 28 per cent., occurred in public institutions, and 11 resulted from violence. The causes of 19, or 3·7 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the large English towns the proportion of uncertified causes did not exceed 0·7 per cent.

Correspondence.

"Audi alteram partem."

THE PLACE OF PROSTHETICS IN THE DENTAL CURRICULUM.

To the Editor of THE LANCET.

SIR,—The General Medical Council's inquiry into the causes of an alleged shortage of dental surgeons has perforce opened up questions as to whether the present curriculum and examination requirements need modification. In your annotation in THE LANCET of Dec. 4th, 1915, and some cognate remarks in earlier issues, you pointedly recognise the fact that an overhauling and tuning up of the educational machine is desirable on other grounds than merely those of an alleged shortage of skilled working hands or the scaring and other damage done by piratical craft. You state that the work required of the future dentist "will be more of the character of dental surgery than dental mechanics," and that the curriculum should be amended in accordance. The difficulty of properly fitting into a scheme of dental education the plebeian subject of dental "mechanics" or prosthetics is hardened by the fact that in all other specialties in medicine instruction or direct interest in the making of appliances has long ago been abandoned and handed over to separate and distinct classes of operatives. The construction of dentures is retained in the curriculum as one of the required subjects of study, and some plain facts justify this attitude of the authorities, even if one excludes what has been done and requires doing in conditions arising out of the present war.

My present object is to suggest that there are two directions in which one might look for a better harmonising of the time given to dental prosthetics with the total time period of the curriculum.

1. If the results of reducing the former three-year period of *exclusive* training in prosthetics to two years should seem to justify a further reduction to one year, a maintaining of the standard of proficiency reached can be made sure of only by a distinct improvement in the method or scheme of instruction. The efficient construction and application of dentures is essentially based upon a knowledge of the forms and normal interactions of the natural teeth, as well as of the cheeks, lips, and tongue, and the pressure reactions of the oral tissues generally. How was that knowledge acquired under the apprenticeship system? In the great majority of cases it was not adequately acquired at all, and in perhaps no case was the degree of knowledge gained anything like commensurate with the time spent—two years, and in many instances a minimum of three whole years. The pupil was left to pick up his ideas of natural teeth from various assortments of porcelain teeth that the manufacturer certainly did not offer for pedagogical purposes. And if a fortunate pupil here and there was encouraged to look into the natural mouth there was no pretence made of giving a course of instruction, systematic or other. Judged by all reasonable tests, the dental schools have had better results from the same two-year period of training. But even in the schools further progress is damped down by the all-pervading traditions of the older and still recognised system of private apprenticeship, under which the study of dental anatomy is not even begun until—*after* at least two years—the pupil is passed on to the hospital school as one fairly competent to construct and apply substitutes for lost natural teeth. From a 12 years' school experience as an instructor in the technical side of prosthetics, I have solid ground for believing that a systematised study of the relevant facts in morphology and dynamics should be entered upon from the beginning and go on concurrently with the technical exercises. This alone should accelerate the student's real progress to an extent equivalent to a gain or saving of at least three to six months on the two years' course. A sound knowledge of surface anatomy should be insisted upon in any rational scheme of instruction in prosthetics, and the collateral value in all practical work of such an introduction to dental anatomy is quite obvious. As the average student learns only those subjects that are scheduled and obligatory, maintenance of the present haphazard system amounts in effect to an actual withholding of knowledge and instruction.

2. The practice of delegating the technical or extra-oral part of prosthetics to mechanics who are outside the immediate control of dental surgeons is increasing. This kind of delegation is justifiable only on the assumption that the dental surgeon is competent to design efficient dentures and to form accurate judgments upon any prosthetic work constructed for him. If, then, the mechanical training period is shortened on the plea that the dentist need not be an expert technician, certain safeguards are called for in order to ensure good prosthetic service for the community. To that end the student in prosthetics should have a much larger amount of clinical instruction and experience, in which his competence and judgment upon all matters relating to the design and application of dentures would constantly be exercised and tested to the satisfaction of expert supervisers. This clinical teaching could be carried as far into the full four-years' course as might be deemed advisable. If, on the other hand, one supposes that such instruction is to be given by practitioners to their pupils in private practice, it is but right from all points of view that the pupil's preparedness to enter a dental school should be reasonably tested by an examination. There should be a bold move

forward and a gathering in of loose ends in order that, in the strenuous days ahead, the dentists of this country may continue to hold their position as second to none.

I am, Sir, yours faithfully,

D. M. SHAW,
Instructor, and Curator of the Mechanical Laboratories, Royal Dental Hospital of London.

Leicester-square, W.C., Dec. 28th, 1915.

GERMAN MEASLES.

To the Editor of THE LANCET.

SIR,—Although the substitution of the title epidemic roseola or roserash for this disease, as suggested by Dr. Clement Dukes in your issue for Dec. 25th, might be desirable, I would suggest that until writers of text-books initiate the practice it is premature to expect the medical profession in general to adopt such a course.

I am, Sir, yours faithfully,

Brighton, Dec. 27th, 1915. C. W. HUTT, M.D., D.P.H.

A COMBINED PHYSICAL TREATMENT FOR DISABLED SOLDIERS.

To the Editor of THE LANCET.

SIR,—*Ex Africâ semper aliquid novi.* In your issue of Dec. 25th a humorous letter is published from the East of Scotland. Dr. T. D. Luke, of Peebles, very modestly describes himself as "a humble balneologist," yet I venture to suggest that even the most humble balneologist usually knows that in neurasthenic conditions there is all the difference between the application of the ordinary douche and the under-water douche or the running-water bath. I would suggest to Dr. Luke that if he made inquiries of the medical authorities at the Grand Palais Hospital in Paris he will find that there is a similar difference between the ordinary hot douche and the hyperthermal *eau courante* treatment, against which he gibes so pleasantly.

I am, Sir, yours faithfully,

J. CAMPBELL MCCLURE.

Harley-street, W., Dec. 28th, 1915.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE WEEK'S SUBSCRIPTIONS.

THE subscriptions to the Belgian Doctors' and Pharmacists' Relief Fund received during the week have been as follows:—

	£	s.	d.
Bournemouth Division, B.M.A. (per Dr. Eleanor C. Bond, Hon. Sec.)—			
Dr. C. J. Girling, Cranborne	0	10	6
Dr. Margaret McNeill ...	1	0	0
Dr. Mantle (per Dr. Barrs)	5	5	0
Dr. G. D. H. Carpenter (eighth donation, total £8)...	1	0	0
Balance of Fund raised by medical men of Mansfield and neighbourhood to give hospitality to a Belgian family who have now returned to Belgium (per Dr. G. Temple Tate)	3	1	2
Dr. Albert May	0	10	6

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

The War.

THE CASUALTY LIST.

THE following names of medical men appear among the casualties announced since our last issue:—

Died of Wounds.

Colonel E. O. Wight, R.A.M.C., Assistant Director of Medical Services, with the 49th division.

Lieutenant O. G. Maginness, attached to the Royal Field Artillery, was educated at St. Bartholomew's Hospital and received his qualification in 1913. Prior to the war he had an appointment in H.M. Dockyard, Pembroke Docks.

Wounded.

Lieutenant J. Campbell, R.A.M.C.

Lieutenant A. C. Edwards, R.A.M.C., attached to the 4th Yorks Light Infantry (T.F.).

Lieutenant F. G. Foster, R.A.M.C.

Captain C. A. Bernard, R.A.M.C., attached to the 4th York and Lancaster Regiment (T.F.).

Captain J. S. Hall, R.A.M.C., attached to the 5th York and Lancaster Regiment (T.F.).

Captain A. L. Shearwood, R.A.M.C.

THE CENTRAL MEDICAL WAR COMMITTEE: MEDICAL ENROLMENT.

Compulsory military service need not affect the position of members of the medical profession, as the arrangements made by the Local Medical War Committees should suffice to meet all the demands of the medical service of the army. Full details of the plan of the Scottish Medical Service Emergency Committee are given below, and the details of the method of procedure in England and Wales, which it is hoped to announce next week, will probably be on the same lines. Medical men in England and Wales who have not yet enrolled should at once do so through the Local Medical War Committees, which are in direct communication with the Central Medical War Committee for England and Wales. This Committee will give to each applicant a certificate of enrolment. It has arranged the grouping of members, and with regard to the order in which individuals should be called on for service it will consider, in coöperation with the Local Medical War Committees, the special difficulties of any individual practitioner. On any point of personal difficulty medical men in England and Wales are invited to communicate direct with the secretaries, 429, Strand, London, W.C.

The Central Medical War Committee has been actively engaged working at certain of the problems which have been lately discussed in Parliament and the daily press in connexion with the demands made by the War Office upon the members of the civilian medical profession. As might have been expected, the principal difficulties arise in connexion with the position of the panel practitioners who are under contract to discharge certain duties, and upon whose services the National Health Insurance Commissioners naturally desire to exercise their lien. Much detailed information is in the hands both of the Commissioners and the executive subcommittee of the Central Medical War Committee as to the number of general practitioners compared with population in the different administrative areas, and the result of coöperation will certainly smooth away some of the difficulties which are only too

apparent. These depend mainly upon the fact that the number of medical practitioners in industrial areas under the ordinary conditions of peace is no more than is reasonably necessary to carry on the average work of these areas. Yet many of these practitioners have gone to the war, and more are urged to do so.

SCOTTISH MEDICAL SERVICE EMERGENCY COMMITTEE.

This Committee has now set out a medical recruiting scheme for 1916. Some months ago, by desire of the various professional executives in Scotland, the Committee undertook the duty of bringing under the notice of practitioners the need of the army for more medical men. At the request of the War Office the Committee agreed further to deal with applications by practitioners for commissions in the Royal Army Medical Corps. The outlines of its policy, and the procedure which it was proposed to follow, were set out in a Memorandum of June 28th last, a copy of which was sent to all Scottish practitioners. The plans so laid down, which were indicated in THE LANCET,[1] were carried out, and a satisfactory response was made by the profession to the calls upon them. Since the period in question, however, there has come into being the general recruiting scheme promoted by Lord Derby, which has impressed all men of military age with an increasing sense of their obligations towards the country, and the Committee has been in consequence requested by the Director-General of Army Medical Services, with the concurrence of Lord Derby, to continue and expand its work in such a manner as to form a link with the general arrangements of the recruiting scheme. The statement of the Committee in view of the new circumstances runs as follows:—

It is intended that the duty of dealing with members of the medical profession in Scotland, so far as the medical service of the army is concerned, shall, subject to the instructions of the Director-General, continue to be discharged by us, and we are authorised to state that medical men who have been approached by agents of local recruiting organisations on the ground that they are of military age, under Lord Derby's scheme for the lay population, should apply to us for guidance.

In drawing up a new scheme to meet these new conditions, we require in the first place to ascertain what service or services each practitioner resident in Scotland will be prepared to render if called upon. The War Office has decided (1) that no man under 45 years of age will be employed as a commissioned officer in the Army Medical Service unless he undertakes general service obligations for a year, and is found to be physically fit for duty at home and abroad; and (2) that no man over 55 years of age will be accepted for home service. In accordance with this decision practitioners are divided into three groups, and the services appropriate to each group are noted in the following schedule:—

Group.	Age.	Service.
A.	Under 45.	Lieut., R.A.M.C. (*general service*).
B.	45 to 55.	Lieut., R.A.M.C. (*home service*). Part-time home military work. Locum tenens away from home (for practitioner absent on service). Part-time home civil work (in carrying on practice or part of practice of neighbouring practitioner absent on service).
C.	56 and upwards.	Part-time home military work. Locum tenens away from home (for practitioner absent on service). Part-time home civil work (in carrying on practice or part of practice of neighbouring practitioner absent on service).

[1] THE LANCET, June 26th, 1915, p. 1374.

As regards these services, attention is drawn to the enclosed registration form, which should be filled in by all practitioners resident in Scotland who do not hold a commission in a branch of the Royal Army Medical Corps or in the Medical Department of the Navy. As it is our duty not only to obtain applications for commissions, but also to safeguard the interests of the general public by preventing undue depletion of any district, offers by practitioners to serve with the army or to act as whole-time locum tenentes will be held as subject to the condition that arrangements can be made to have their present civil work carried on during their absence.

In organising medical effort throughout Scotland generally, we propose to act as heretofore in coöperation with the Local War Committees which we have recognised for each division of the British Medical Association. When the results of our registration inquiry have been ascertained and collated we shall confer with these Local Committees and determine the number of practitioners who should be expected to go on service from each area. The Local Committees, acting on our instruction, will, after timeous notice, as occasion demands, call upon selected practitioners to give the service appropriate to their age group.

In making a call for whole-time military service, the Local War Committee will issue to practitioners the Army Form of Application for a Commission in the Royal Army Medical Corps, and these forms, when filled in, should be returned to the secretary of the Local War Committee, and the subsequent arrangements should be made through him. In making calls for other services, the secretary of the Local War Committee will provide practitioners with all necessary information. These calls, which will be successive, will begin to be made in the month of January, 1916. Precise dates for calls succeeding the first cannot now be stated. We shall, in instructing Local Committees, be guided by our knowledge of the needs of the army as intimated to us from time to time by the Director-General.

This statement of the Committee concludes with an intimation that on any question of duty which may arise in consequence of such calls or otherwise, practitioners are at liberty to refer to the Committee as a body duly appointed and empowered to issue letters of excuse. Notice to this effect can be given on a form which may be obtained from the secretary. Questions of physical fitness or unfitness are expressly excluded from the province of the Committee. These can be decided only by a Regular Officer of the Royal Army Medical Corps following an application for a commission as lieutenant. Those found physically unfit should offer for one or more of the remaining services in the schedule.

The statement is signed by A. H. F. Barbour, President of the Royal College of Physicians, Edinburgh; James Hodsdon, President of the Royal College of Surgeons, Edinburgh; Ebenezer Duncan, President of the Royal Faculty of Physicians and Surgeons of Glasgow; J. A. Kynoch, Dean of the Faculty of Medicine, University of St. Andrews; T. H. Bryce, Dean of the Faculty of Medicine, University of Glasgow; Theodore Shennan, Dean of the Faculty of Medicine, University of Aberdeen; Harvey Littlejohn, Dean of the Faculty of Medicine, Edinburgh University; John C. M'Vail, Deputy Chairman, National Health Insurance Commission, Scotland; Robert Muir, Professor of Pathology, University of Glasgow; T. K. Monro, Regius Professor of the Practice of Medicine, University of Glasgow; J. R. Hamilton, Chairman, Scottish Committee, British Medical Association; John Adams, Vice-chairman, Scottish Committee, British Medical Association; John Playfair, President of the Edinburgh Medical Guild; John Gordon, President, Aberdeen Branch, British Medical Association; John Stevens, Secretary, Edinburgh Branch, British Medical Association; J. R. Currie, Medical Officer, National Health Insurance Com-

mission, Scotland; Norman Walker, Direct Representative for Scotland on the General Medical Council (convener).

The statement is accompanied by two forms. One is to be filled in by practitioners not now holding a commission. The other is directed to practitioners already holding a commission when the intimation form should be filled in, either by himself or by some person on his behalf. Either a registration or an intimation form—but not both—should be filled in in respect of each practitioner. The appropriate forms, duly filled in, are being received by the secretary, Scottish Medical Service Emergency Committee, Royal College of Physicians, Edinburgh.

WORK OF THE RED CROSS.

The report of the joint finance committee of the British Red Cross Society and the Order of St. John of Jerusalem has just been issued. It is a document of which the country should be proud, especially as the work it records has been accomplished mainly by voluntary helpers. The report deals with the year which ended on Oct. 20th, 1915, and shows how more than a million and a half of money has been used economically and beneficently on behalf of our sick and wounded. Although for all practical purposes the work of the two societies began on the first day of the war it was not till Oct. 20th, 1914, that the societies agreed to work hand in hand under a joint war committee, which during the 12 months under notice has spent £1,864,036. The expenses of management, excluding appeals, have amounted to only 1¾ per cent., or 2¼*d.* in the £, on the whole income. If the cost of appeals be added it makes the expenses of management 3½*d.* in the £. It is interesting to note that on Oct. 20th last year the societies had 897 motor ambulances at work, while the total number of vehicles in use was 1301. The following is a summary of the figures relating to the year's work:—Hospital stores and comforts handled, £463,455 (cost of handling, 2·96 per cent.); spent in France and Flanders (not including motor ambulances), £293,509; spent in Malta and Near East (mainly for Gallipoli), £194,812; spent in Serbia and Montenegro, £43,846; spent on "transport of wounded" (mainly motor ambulances), £615,963; number of motor ambulances, cars, kitchens, &c., at work, 1301; spent on hospital trains, £48,097; spent on maintenance of British Red Cross Hospital, Netley, £69,758; spent on St. John Brigade Hospital, Étaples, £42,818; spent on King George Hospital, Stamford-street, London, £49,153; spent on Calais Enteric Hospital, £17,643; spent on hospitals and convalescent homes in Egypt, £25,604; spent on Australian Forces in Egypt, £21,054.

We regret to record the death in Flanders, on Dec. 19th last, of Colonel Ernest Octavius Wight, M.R.C.S., D.P.H., Assistant Director of Medical Services, who was killed by a shell while he was helping to extricate some of his motor ambulances from a dangerous position.

GERMAN CASUALTIES.—Mr. Tennant stated recently, in reply to a question in the House of Commons, that the total casualties as published in the official casualty lists for Prussia, Saxony, Bavaria, and Würtemberg up to Nov. 30th, 1915, amounted to 2,524,460. Of these, 484,218 were killed or had died of wounds, 384,198 were severely wounded, 27,674 had died of disease, and 381,149 were missing. These figures did not include the naval casualties.

WAR SERVICE BADGES.—An Army Council Order was issued on Dec. 20th last stating the decision to issue armlets (1) to men who presented themselves for service in the army since the beginning of war and up to midnight on Dec. 12th, but who were rejected on medical grounds; (2) to men who after midnight on Dec. 12th presented themselves for immediate service with the colours and who were rejected on medical grounds. Each class will be divided into two categories: (*a*) Men who on examination have been certified as medically unfit on account of organic disease; and (*b*) men who have been rejected on account of eyesight or some slight physical defects. The men in category (*a*) of each class will be registered, but those in category (*b*) of each class will be attested and passed to the Army Reserve. In no case will an armlet be issued to men who are obviously unfit for service in the army, such as those who are totally blind, crippled, or paralytic.

DUNDEE UNIVERSITY AND THE WAR.—The annual report of University College, Dundee, states that the war has caused a serious diminution of men students, and it seems that under the pressure which is now being exercised in recruiting none of the men undergraduates, save only those physically unfit or under military age, will be left. The war has also seriously affected the finances, and the accounts closed with a deficit of £280. It was estimated that during the current year the fees would show a further reduction.

ECONOMY IN BRAINS.—The medical profession is not the only one which views with anxiety the waste of brains in the firing line. At the conference of headmasters held at the Board of Education on Dec. 22nd and 23rd a resolution was unanimously carried affirming that—

> In the opinion of this conference very grave loss to the country is caused by the employment of young students of exceptional mathematical and scientific ability as subalterns in line battalions.

Mr. A. L. Francis, M.A., headmaster of Blundell's School, Tiverton, who moved the resolution, emphasised the fact that, the present war being eminently a war of science, the place for the young man who had a special gift for science, mathematics, or mechanics was in the laboratory.

THE CRAIGLEITH HOSPITAL CHRONICLE.—In the Christmas number Lieutenant-Colonel Sir Joseph Fayrer gives some interesting figures of the number of men treated in Craigleith and the other military hospitals in Edinburgh up to and including Nov. 23rd last. The total number is 12,466, of which 10,564 were at Craigleith, 754 at the Royal Infirmary, 344 at the Deaconess Hospital, 109 at the Leith Hospital, and 694 at Dalmeny. The numbers include men of the Expeditionary, Mediterranean, Home Service, Canadian, Australian, Belgian, and South African Forces. The Home Service furnished the largest number—8327. There were 67 Belgians, 57 Canadians, and 5 Australians.

SERBIAN RELIEF FUND.—Reports from Salonika continue to confirm the fact that such hospital staffs as were able to escape from Serbia are stranded there with no immediate opening for useful work. The French are arranging free transport to Ajaccio, Corsica, where a refugee camp has been established for 2000 Serbians, and 4000 other refugees are expected in France. This work for the expatriated Serbs takes the place for the present of definite hospital work. The address of the Serbian Relief Fund is 5, Cromwell-road, S.W.

R.A.M.C. MEN IN TRAINING AT EASTBOURNE.—The correspondent of the *Star* at Eastbourne gives an interesting account of the 3000 men who are at present training there. They form about 6 per cent. of the population of the town, a proportion large enough to make itself felt, and it is recorded of them that "their exemplary behaviour renders their presence in the town a source of real pleasure." The companies are drawn from all parts of England, and there are a few recruits from Scotland, Wales, and Ireland. The day's work begins at 6.55 A.M. with the roll-call. Parades are held at 9 A.M. and 2 P.M., and there is a tattoo at 9.30 P.M. The instruction takes the form of squad drill, Swedish drill, stretcher drill, lectures, and route marches. On the downs there are many opportunities of hill-climbing, and after a full morning's drill the men have been known to cover 15 or 16 miles in the afternoon. The lectures given deal with such subjects as hygiene and physiology. The

men are taught to stop hæmorrhage and how to deal with fractured limbs. Small groups are engaged in bandaging and applying splints. So great is the eagerness to learn that the available stock of R.A.M.C. manuals has been exhausted. Sports clubs have been formed in connexion with the various companies, the games chiefly in favour being football and running. There have been football matches with other corps and with school teams. When the R.A.M.C. have arranged a fixture the severest weather will not prevent them from an appearance on the field.

THE PRINCE GEORGE MOTOR AMBULANCE.—A motor ambulance has been presented to the Belgian Field Hospital by readers and friends of the "Children's Story of the War." More than 11,000 children have subscribed to the cost of this ambulance, which the Queen has permitted to be named after Prince George.

INTERCESSION DAY.—The British Red Cross Society and the Order of St. John have arranged that in every church and chapel to-morrow (Jan. 2nd) prayers will be offered for the victory of our soldiers, and a collection made for the relief and comfort of our sick and wounded at the front.

Professor G. L. Gulland has returned to Edinburgh at the conclusion of his term of service as consulting physician to the troops and hospitals in Malta, and has resumed teaching at the University.

Medical News.

UNIVERSITY OF OXFORD.—The following candidates have been successful in the undermentioned examinations:—

Organic Chemistry.—G. Aldred-Brown, P. Boobbyer, W. Boone, T. Brown, R. Emmons, E. Liddell, W. Allan-Row, T. Ryves, N. Smith, H. Toms, and E. Watkins.
Anatomy and Physiology.—E. Crook, W. Gover, C. Krige, R. Roberts, G. Stone, and E. Woods.
Pathology.—J. Blamey, E. Creed, L. Davies, W. Dawson, G. Perkins, C. Sells, and N. Sprott.
Forensic Medicine and Public Health.—A. Traill, A. Watts, and D. Whitcombe.
Materia Medica.—L. Davies and J. Walker.
Medicine, Surgery, and Midwifery.—G. Bowes, L. Davies, A. East, L. Gameson, G. Gimlette, H. Jeffries, M. Lawrence, H. Oddy, C. Sells, A. Traill, and D. Whitcombe.
Diploma in Public Health.—Part I.: E. F. Butler, J. T. MacManus, and R. H. Vercoe. Part II.: E. B. Argles, T. R. Bowen, and E. G. Brander.

UNIVERSITY OF LONDON.—At examinations for medical degrees held recently the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—Abraham Solomon Erulkar, B.S., Guy's Hospital.
Branch IV., Midwifery and Diseases of Women.—Lilias Margaret Blackett, B.S. (University medal), London (Royal Free Hospital) School of Medicine for Women; and Dorothy Cochrane Logan, B.S., University College, Cardiff, and London (Royal Free Hospital) School of Medicine for Women.

SECOND EXAMINATION FOR MEDICAL DEGREES.

Part I.—*Marjorie Back, London (Royal Free Hospital) School of Medicine for Women; Jacob Brodetsky, B.Sc., London Hospital; *Kathleen Mary Cogan and Doris Marjorie Howard, London (Royal Free Hospital) School of Medicine for Women; Arthur St. George Joseph McCarthy Huggett, St. Thomas's Hospital; Muriel Mercer Kenworthy, Jessie Craig Ritchie, and Joan Margaret Ross, London (Royal Free Hospital) School of Medicine for Women; and Ethel Nancy Thomas, D.Sc., University College.
* Awarded a mark of distinction.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates were successful in the subjects indicated:—

Surgery.—A. Z. Abushady (Sections I. and II.), St. George's Hospital; R. N. Craig (Sections I. and II.), Durham and Guy's Hospital; C. B. de Forest (Sections I. and II.), Michigan; W. Fox (Section II.), Charing Cross Hospital; L. Kahan (Section I.), London Hospital and Lausanne; I. H. Lloyd (Section I.), Westminster Hospital; J. S. Matthews (Sections I. and II.), London and University College Hospitals; A. W. North (Sections I. and II.), Birmingham; I. H. Pearse (Sections I. and II.), Royal Free Hospital; E. E. Samaraweera (Sections I. and II.), King's College Hospital; and J. G. T. Thomas (Sections I. and II.), St. Mary's Hospital.
Medicine.—W. F. R. Castle (Sections I. and II.), Cambridge and London Hospital; R. N. Craig (Section II.), Durham and Guy's Hospital; W. J. May (Section I.), London Hospital; G. S. Mitchell (Sections I. and II.), Westminster Hospital; A. W. North (Sections I. and II.), Birmingham; I. H. Pearse (Sections I. and II.), Royal Free Hospital; T. C. Russell (Sections I. and II.), St. Mary's Hospital; and R. H. Yolland (Sections I. and II.), Cambridge and King's College Hospital.
Forensic Medicine.—W. F. R. Castle, Cambridge and London Hospital; R. N. Craig, Durham and Guy's Hospital; G. S. Mitchell, Westminster Hospital; I. H. Pearse, Royal Free Hospital; C. G. G. Winter, St. Mary's Hospital; and R. H. Yolland, Cambridge and King's College Hospital.
Midwifery.—R. N. Craig, Durham and Guy's Hospital; I. H. Lloyd, Westminster Hospital; and I. H. Pearse, Royal Free Hospital.
The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: A. Z. Abushady, R. N. Craig, W. Fox, I. H. Pearse, and E. E. Samaraweera.

LONDON SCHOOL OF TROPICAL MEDICINE.—At the examination at the end of the forty-ninth session of this school the following candidates were successful:—

V. A. Goonetilleke (Ceylon Medical Service), M. de Costa, T. Ryan (West African Medical Service), E. J. Rowbotham, and R. J. Tata.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial on Dec. 17th, 1915, the following candidates were recommended to receive degrees:—

Doctor of Medicine.—Edwin Charles Girling, George Duncan Logan (commended for thesis), Stewart M'Naughton (highly commended for thesis), Adelaide Anna Renshaw, William Russell (highly commended for thesis), Charles Parker Stewart, Vattaparampil Sankara Valiathan, and Griffith Jones Williams.
Bachelor of Medicine and Bachelor of Surgery.—William Brownlie (first-class honours), Thomas Frederick Corkill, Henry Fotheringham Ferguson, George William Marshall Findlay (first-class honours), Pratul Kumar Ghosh, Robert Lancelot Impey, Henry Bruce Kirk, Andrew John M'Ivor, Premrai Trambakrai Majmundar, Kumud Sankar Ray, Arthur John Desmond Rowan, Clement Ings Stockley, Guy Melchoir Torrance, Reginald Arthur Warters, James Augustus Williams, Wyndham Williams, Tin Po Woo (Ng), Margaret Kirk Jolly Wright, and Peter Hutchison Young.

UNIVERSITY OF DUBLIN: TRINITY COLLEGE, SCHOOL OF PHYSIC.—At the Michaelmas examinations the following candidates were successful in the subjects indicated:—

PRELIMINARY SCIENTIFIC EXAMINATION.

Chemistry.—Derrick Haughton Gardiner Fishbourne, Henry Allman Lavelle, John Charles Joseph Callanan, William Joseph Hogan, Eric Wallace Harris, George Robert Leslie Jordan, John Gerard Holmes and Mayo Francis Meade (equal), Edward Henry Montgomery, Jacobus Frederick Van Staden, and Samuel John Laverty.
Physics.—Charles William Parr, Thomas Falkland Litton Cary, and George Robert Leslie Jordan.
Botany and Zoology.—John Farnsworth Sheppard, Victor George Walker, Richard Dominick Murphy, John Gerard Holmes, Derrick Haughton Gardiner Fishbourne, Eileen Hilda Dowse, Patrick Joseph Healy, Albert Victor Foster, Harry Cristol Dundon, Edward Henry Montgomery, and Patrick Joseph Duggan.

INTERMEDIATE MEDICAL EXAMINATION.

Part I., Anatomy and Physiology.—Eric James Lyndon, William Frederick McConnell, John Benson McGranahan, Cecil Keller and William Leech Young (equal), Percival Atkin Dormer, Kenneth Greer, James Michael Hill, Thomas Tabuteau, Joseph Posner, Daniel McElwee, Frederick John Dymoke and Frederick William Godbey (equal), James Arthur William Cullen, and Jason Grant Bird.
Part II., Applied Anatomy and Applied Physiology.—Charles Going Ambrose, Percy Crowe Parr, Margaret Wolfe, Patrick Casey, and William Joseph Hamilton, John Edmund Hill, Meta Grace Jackson, and Frederick John Dymoke (equal).

FINAL MEDICAL EXAMINATION.

Part I., Medical Jurisprudence and Hygiene, Materia Medica and Therapeutics, and Pathology.—Andrew Hope Davidson, William Frederick Wicht, Philip Augustus Hall, William Garde-Browne, Joseph Godfrey Bird, Robert William Prichard, John Philip Macnamara, James Benjamin Taylor, Hastings Harley Molloy (Pathology, Medical Jurisprudence and Hygiene), Millicent Hamilton-Johnstone (Pathology), and Michiel Christoffel Dippenaar (Materia Medica, Medical Jurisprudence and Hygiene).
Part II., B.A.O., Midwifery and Gynæcology.—Joseph Wallace Bigger, Thomas Paul Chapman, Robert Clement Burke Ramsay, Clotilda Bayne Bevis, Rupert Montgomery Butler Gordon, Francis William O'Connor, William Garde-Browne, Philip Augustus Hall and Charles Lewers McDonagh (equal), and William Lionel Bates.

SPECIAL FINAL EXAMINATION.

Part II., B.Ch. Surgery.—Geraldine Murphy, Herbert Mitchell, Cecil McLaren West, William Fothergill Wilson, Cecil Guedalla Sherowitz, William Benjamin Walker and Godfrey Bateman and Thomas William Sweetman (equal), Robert Lancelot Vance, Roland Harris Graham and Joseph Henry Cranston Walker (equal), David Henry Hall, Grosvenor Leyburne Murphy, William Hunt, and Arthur George Fisher.
Part II., M.B., Medicine.—Thomas William Sweetman, Herbert Mitchell, Clara Beatrice Marguerite Adderley, Cecil Guedalla Sherowitz, Edward Mannin, Thomas Edward Beatty, Roland Harris Graham, William Hunt, Arthur George Fisher, and Maurice Bayliss King.
Part II., B.A.O. Midwifery and Gynæcology.—John Arthur Crozier Kidd, John Milo Ryan, Marie Annette Hadden, Alan Francis Grimbly, Louis Blumberg, Eileen Gertrude Gwynn, Thomas Galvin Roche, Edwin Boyers, and William Hunt.

FINAL EXAMINATION.

Part II., B.Ch., Surgery.—Thomas William Gerald Johnson, George William Doran, Thomas Edward Beatty, and Francis William O'Connor.

Part II., M.B., Medicine.—Alan Francis Grimbly, Edward Lipman, Frederick John Murphy, Robert Lancelot Vance, Esther Violet Adderley, Marie Annette Hadden and David Henry Hall (equal), Violet Mabel Deale, Grosvenor Leyburne Murphy, and Francis William O'Connor.

M.D. EXAMINATION.

Brian Dodwell Crichton and Rev. Ernest Edward Lavy.

M.CH. EXAMINATION.

Arthur Chance (high marks).

DENTAL EXAMINATIONS.

Preliminary Scientific: Chemistry and Physics.—Irene Olive Dorman.

Dental Anatomy.—Francis Spencer Judd.

DIPLOMA IN PUBLIC HEALTH.

Parts I. and II.—Ratan Edulji Dastur.

THE LEEUWENHOEK MEDAL.—Professor H. A. Lorenz, president of the Dutch Academy, writing to congratulate Surgeon-General Sir David Bruce, A.M.S., adds that Leeuwenhoek was a foreign member of the Royal Society, and the greater part of his discoveries were first published in the Philosophical Transactions. The award is made every ten years, and this is the first made to a British scientist, the previous laureates being Ehrenberg (1875), Ferdinand Cohn (1885), Louis Pasteur (1895), and Beyerinck (1905).

LEBANON HOSPITAL FOR MENTAL DISEASES.—This hospital is situated at Asfuriyeh, near Beyrout, Syria, and was founded in 1900 by the late Mr. Theophilus Waldmeier. Owing to the war the seventh annual report is somewhat belated in its appearance, but it shows a record of excellent work. For the year ending March 31st, 1915, 55 men and 31 women were admitted to the hospital. If to this number is added 109 patients who remained in the hospital on March 31st, 1914, the total number of patients cared for in the hospital during the year is 195. The financial report shows a slight increase of receipts from subscriptions, though the payments from friends of patients show a fall of £353. The general health of the hospital throughout the year has been good. At the present moment, owing to the war, provisions of all kinds are exceptionally high in price, while patients are unable to contribute to their maintenance; but the work of the hospital is still being carried on under the able direction of Dr. H. Watson Smith and an English matron. As it is impossible to send money direct from London to Beyrout, the financial affairs of the hospital are managed for the present by the American Presbyterian Board.

MEDICAL SICKNESS AND ACCIDENT SOCIETY.—A meeting of this society was held on Dec. 17th, 1915, at 300, High Holborn, Dr. F. J. Allen being in the chair. The reports submitted showed that during the month of November the claims for sickness had risen slightly above expectation, but that for the whole year so far the total experience was below the total expectation. In spite of the congestion of business generally owing to the war it was reported that new proposals received were greater in number than those for the same period in the preceding year. The number of additional proposals received had been fairly well maintained. One satisfactory feature noted was the increase in the combined sickness and accident and life assurance contracts issued, and the tendency among existing members to avail themselves of the opportunity of increasing their insurances in the society by the addition of endowment life assurances, payable at the age of 65 or previous death. The number of claims from members on active service had, fortunately, been few, in comparison with the total number who were serving in the Royal Army Medical Corps and similar forces. The complete figures of this item will probably be included in the chairman's speech at the next annual general meeting. The soundness of the financial administration of the society during its 33 years of existence was of decided import to members under the present disturbed conditions. The practice of writing down Stock Exchange securities, when necessary, had shown itself to be a wise one, in view of the heavy fall in stock values. It was anticipated that a further sum would have to be written off investments at the close of 1915, but, as practically all the society's holdings were stocks repayable at par at fixed dates, there was no real loss. Members of the medical profession would be well advised to avail themselves of the society's insurance against sickness and accident, and any desirous of so doing can obtain all information and a prospectus on application to the Secretary, Medical Sickness and Accident Society, 300, High Holborn.

PRESENTATION TO MR. H. G. BARLING.—At a gathering on Dec. 22nd, presided over by the Lord Mayor of Birmingham, a presentation was made to Mr. H. Gilbert Barling, F.R.C.S., Vice-chancellor of the University of Birmingham, on the occasion of severing his active connexion with the Birmingham General Hospital after 36 years' service. The presentation took the form of an illuminated address and his portrait in oil colour to be hung in the board room.

THE LEAGUE OF MERCY.—The annual meeting of the League of Mercy was held at St. James's Palace on Dec. 21st, 1915, when Lord Farquhar, who presided, read a letter from the King's private secretary in which their Majesties rejoiced that during the 17 years of the League's existence it had distributed no less than a quarter of a million sterling to the hospitals in and around London. Sir Frederick Green, the treasurer, said the total income for the year was £19,582, an increase of £602 over the previous year. A sum of £14,000 had been given to King Edward's Hospital Fund. The list of district totals was headed by Westminster with £1832 more than last year; South Kensington followed with an increase of £1150. Sir William Collins, referring to the rise in the cost of hospital necessities owing to the war, said that quinine had gone up from 8*d.* per ounce to 5*s.* 6*d.*, while aspirin had advanced from 2*s.* to 48*s.*, and atropine had gone up by enormous leaps. During the meeting Prince Alexander of Teck bestowed the Order of Mercy upon a number of ladies and gentlemen.

DEATH OF A VETERAN PHYSICIAN.—John Rimington Fothergill, M.D. St. And., died at his home in Darlington on Dec. 13th in his ninety-first year. He was the senior magistrate of the borough and was for many years honorary physician to the local hospital. He was a great-great-nephew of John Fothergill, of London, physician and Quaker philanthropist, who died in 1780; and his father was John Fothergill, M.R.C.S., who left his native Wensleydale to practise in Darlington about 100 years ago. John Rimington Fothergill was born just when the world's first passenger train began to run between Darlington and Stockton in 1825. After studying in Edinburgh he joined his father in 1848, and in that year they used chloroform in a case of puerperal eclampsia—probably the first application of anæsthesia to this condition. Thirty years later he retired from active practice, but continued to act as a consulting physician for another 20 years. Dr. Fothergill took an active part in the civic, philanthropic, and political life of his town, remaining a strong Liberal to the end. A keen fox-hunter in his earlier days, he continued to catch salmon in the river Tees until arthritis lamed him when he was about 75.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

British Casualties.

Mr. ASQUITH has furnished the following statement regarding British casualties in all fields of operation up to Dec. 9th, 1915:—

Flanders and France.

	Killed.	Wounded.	Missing.	Total.
Officers	4,829	9,943	1,699	16,471
Other ranks...	77,473	241,359	52,685	371,517
				387,988

Dardanelles.

Officers	1,667	3,028	350	5,045
Other ranks...	24,535	72,781	12,194	109,510
				114,555

Other Theatres.

Officers	871	694	100	1,665
Other ranks...	10,548	10,953	2,518	24,019
Totals... ...	119,923	338,758	69,546	25,684

Grand total all theatres, 528,227.

The Establishment of the Army.

The House of Commons has authorised an addition of 1,000,000 men to the land forces of the Crown, bringing the establishment up to 4,000,000.

Midwives (Scotland) Act.

The Midwives (Scotland) Act received the Royal assent on Thursday, Dec. 23rd.

The Christmas Recess.

Parliament has risen for a short Christmas recess. The House of Commons will resume on Tuesday, Jan. 4th. During the debate on the adjournment for the holidays, various points relating to the recruitment of the Royal Army Medical Corps and to the details of its administration were raised. Mr. TENNANT, the Under Secretary for War, replied to the discussion on these matters.

HOUSE OF COMMONS.

MONDAY, DEC. 20TH.

German and Austrian Medical Men.

Commander BELLAIRS asked the Under Secretary for Foreign Affairs how many German and Austrian doctors and so-called German and Austrian Red Cross employees had been allowed to go through our naval blockade under safe conducts to Europe and how many under instructions from the Foreign Office without safe conduct; and what equivalent was obtained from Germany in the number of British subjects released.—Lord ROBERT CECIL replied: The number of such persons given safe conducts is 86 and the number of those who were to be allowed to pass without safe conducts is 69. I am not aware of the precise number in each category who may have been arrested on the way owing to suspicion of fraud, but the number is not large. With regard to the last part of the question, His Majesty's Government have not so far felt obliged to refuse requests made to them on the ground of the Geneva Convention for the free passage of enemy doctors and Red Cross employees returning to their own country from overseas. In most cases doctors and Red Cross officials captured or detained by the Germans have been also released. But as in some cases they have not done so, His Majesty's Government is considering the advisability of detaining similar German individuals who would otherwise be returned.

Hospital Units in the Balkans.

Mr. ALDEN asked the Under Secretary for Foreign Affairs whether he was able to make any statement regarding the present position of the various hospital units from England and Scotland that had been compelled to leave Serbia.—Lord ROBERT CECIL answered: Sir Ralph Paget, who is acting for His Majesty's Government in this matter, has succeeded in collecting the members of the British units who had escaped from Serbia at San Giovanni di Medua, from where it is hoped to transport them to Italy. Till transport is provided, which I hope will be very shortly, Sir Ralph Paget may be trusted to do all that is possible for the safety and comfort of the units under his charge.

Recruits and Minor Physical Defects.

Mr. BOYTON asked the Financial Secretary to the War Office whether he was aware that a number of proposed recruits were rejected for minor physical defects, many of which could be successfully dealt with in general hospitals; and whether His Majesty's Government would consider the desirability of paying those who offered to undergo operations or treatment at army rates with dependent allowances whilst they were detained in hospital, provided that they had previously attested.—Mr. FORSTER replied: The number of men rejected for physical defects of a kind which could be cured by surgical operations is inconsiderable, and the risk and disadvantages of the course suggested are so serious that I fear I cannot adopt it.

Dentists with the Expeditionary Force.

Answering Sir A. MARKHAM, Mr. TENNANT (Under Secretary for War) said: There are 43 dentists employed with the Expeditionary Forces in France, exclusive of those employed with the Canadian contingent.

Uninoculated Officers.

In reply to Mr. ANDERSON, Mr. TENNANT said: A commanding officer of any unit would be within his rights and powers in preventing any uninoculated officer from proceeding on active service overseas, because such an officer may, if he contracts enteric fever, be a grave source of danger to his brother officers and the men under his command.

Panel Practitioners in England.

Sir E. CORNWALL asked the representative of the National Insurance Commissioners what was the number of doctors now on the panel in London and in the provinces, respectively, as compared with the totals on July 1st, 1914.—Mr. C. ROBERTS answered; The figures on July 1st, 1914, are not obtainable without a special return from Insurance Committees, but the figures for January, 1914, which would not differ materially from those of the following July were: London, 1400; other English areas 14,600 (including doctors on more than one panel). The corresponding figures of doctors who will be on the panel for 1916 are approximately: In London 1440, in other English areas 14,400. These figures include a number of medical men on military service, whose names remain on the panel whilst some other doctor or doctors are undertaking to carry out their duties.

TUESDAY, DEC. 21ST.

The Drug Tariff.

Mr. BOOTH asked the representative of the National Insurance Commissioners whether the Commissioners had asked the London Insurance Committee to administer the new drug tariff for 1916; whether the Committee on Thursday declined to receive a report that they should do so; whether a special committee had been appointed to examine further the Commissioners' proposal; whether he could see his way to modify the scheme so as to avoid an increase of staff; and was he aware that it was estimated that at least £4000 additional yearly cost would fall upon London to carry out the larger part of the Commissioners' proposals.—Mr. C. ROBERTS said, in reply: The duty of pricing prescriptions has been transferred to Insurance Committees by regulations recently framed in accordance with the recommendations of the Departmental Committee on the Drug Tariff, and it is the statutory duty of Committees to make administrative provision for the purpose of calculating the payments due to chemists under the agreements already entered into for 1916. The Commissioners have been in communication with the Committee as to the arrangements necessitated by this duty which they understand are in course of preparation by the Committee. Committees have already been informed that special provision will be made for meeting any additional expenditure properly incurred by them on this work out of sums released in consequence of the new tariff arrangements. Any such estimate as is suggested of the additional cost involved would appear, however, to be in excess of all reasonable anticipation.

WEDNESDAY, DEC. 22ND.

First Eastern General Hospital.

Sir F. BANBURY asked the Under Secretary of State for War whether the kitchen arrangements in the First Eastern General Hospital were planned for 520 patients and whether they now had to provide for 1500 patients; whether the commandant of this hospital was in charge of two other institutions; and what salary did he receive.—Mr. TENNANT replied: The facts are substantially as stated in the first part of the question. The hospital has expanded and outgrown the original kitchen accommodation. The question of improving the kitchen arrangements has been taken in hand, and I hope the defects will soon be remedied. In the expansion two other section hospitals have been formed which are in the general charge of the commandant of the hospital and administered under him by officers commanding sections. The commandant is a colonel in the Territorial Force, Army Medical Service, and draws the pay of his rank.

Medical Missions to Serbia.

Mr. MILLS asked the Secretary of State for Foreign Affairs whether any list of the doctors and nurses who had left Serbia had been received by His Majesty's Government; and, if so, whether such list would be published.—Sir EDWARD GREY wrote in reply: No list has been received. Our latest information is that Sir Ralph Paget arrived at Brindisi on Dec. 18th with 120 members of the medical missions to Serbia.

Vaccination Acts in Dublin.

Mr. NUGENT asked the Chief Secretary to the Lord Lieutenant in Ireland whether he was aware that Dublin soldiers who were fighting in the trenches had recently been prosecuted and convicted in their absence as defaulters under the Vaccination (Ireland) Act; was he aware that if those soldiers had resided in Great Britain they would have been able to avoid the risk of such proceedings by making a declaration of conscientious objection to the vaccination of their children; and whether he will give instructions to boards of guardians in Ireland for the suspension of the issuing of summonses for non-vaccination until such opportune time as the law on this subject should in Ireland be made similar to that which obtained in Great Britain, and thus conform to the recommendations of the Royal Commission on Vaccination.—Mr. BIRRELL (in a written answer) replied: Legal proceedings have recently been instituted in Dublin against defaulters under the Vaccination Acts. The papers did not show whether the persons in default were civilians or whether any of them belonged to the army. There are no exemptions from vaccination and it would be

most unfair if children were not protected from small-pox while their fathers were at the war. As regards the latter part of the question, I would refer the honourable Member to a previous reply on the subject.

THURSDAY, DEC. 23RD.

Epsom Asylum.

Replying to Mr. TYSON WILSON, Sir JOHN SIMON (the Home Secretary) said that owing to the paramount need for economy the Treasury had felt it their duty to object to a further loan for carrying out the contract for the erection of an asylum at Epsom. Negotiations with the contractor were still pending. He was informed that none of the blocks could be completed under 12 months apart from lighting, heating, and drainage. The question of using them as hospitals for wounded soldiers had been considered by the Army Council, but the Council did not think it necessary to complete the blocks for this purpose.

Tuberculosis Treatment.

Sir EDWIN CORNWALL asked the representative of the National Insurance Commissioners to state the amount contributed under the Act in respect of the treatment of tuberculosis cases in this country in the four years ending March, 1915.—Mr. C. ROBERTS wrote in reply: Subject to some slight adjustment the amount available under Section 162 of the National Insurance Act, 1911, in respect of the period July 15th, 1912, to Dec. 31st, 1914, for defraying the expenses of sanatorium benefit in the United Kingdom is £2,150,000. Further, a sanatorium benefit grant of £100,000 was voted in the supplementary estimates for 1914–15, £50,000 being paid into the special account for credit to the four National Health Insurance Funds, and the balance being revoted in the estimates for 1915–16. I may add that these figures do not include sums of £125,000, £180,000, £480,000, and £385,000 voted in the estimates (original and supplementary) for 1913–14 and in the estimates for 1914–15 and 1915–16 respectively as provision for statutory grants under Section 17 of the National Insurance Act, 1911, and for special grants towards the cost of schemes undertaken by local authorities or combinations of local authorities with the approval of the departments administering the grants for the treatment of tuberculosis generally.

A Leprous German Prisoner.

Mr. BUTLER LLOYD asked the Under Secretary for War whether he was aware that a German prisoner of war, in an advanced condition of leprosy, had been kept for many months, in spite of repeated remonstrances from the officer of the guard of the King's Shropshire Light Infantry, within a few paces of the sentry and guard-room at Handsforth, near Manchester; and whether he would take immediate steps to have him removed to a more suitable locality.—Mr. TENNANT answered: Special accommodation has been prepared for this prisoner of war at a hospital at Dartford and he is now being removed there.

Mr. E. HARVEY: Would it not be possible to make arrangements to send this prisoner back in the next party of exchanged prisoners?—Mr. TENNANT: I do not think that would be a good thing to do.

Medical Men and Service in the Army.

Mr. PRINGLE asked the Prime Minister whether civilian doctors up to 45 years of age were being asked to join the Royal Army Medical Corps; whether he was aware that doctors already in the service were in many cases performing routine and other duties which could be equally well performed by men who had not a medical qualification; and, if so, whether arrangements would be made to relieve doctors in the service of such duties before further depleting the number of doctors available for the civilian population.—Mr. ASQUITH answered: There is urgent need for qualified medical men due to wastage and the necessity for equipping new units. My information does not support the allegation contained in the last part of the question.

The Needs of the Civil Population.

On the motion for the adjournment for the Christmas recess,

Mr. PRINGLE called attention to the employment of medical men in the service of the army and the further drafts upon the civilian doctors which were being made at the present time. The depletion of the supply of civilian doctors was becoming a serious matter for the whole civil population and the country, and obviously a large number of further doctors would be required with the million of men, for the raising of whom the House had just granted authority. He wanted to know whether the War Office was going to recruit medical men for the new forces on the same scale as they had been recruited for the armies that had been raised, and whether their services were to be used as wastefully and as uneconomically as those of the doctors who were at present serving. He would only deal with certain branches of the subject. At the present time there were many field ambulances in this country all with a full complement of medical officers, and the great majority of those officers were doing practically no medical work. At least their medical work was negligible in quantity. The great majority of them had nothing to do but to attend to the feet of recruits. That was a wasteful use of the services of skilled medical men. These ambulances could be dealt with by a much smaller number of skilled medical men, and if the skilled medical men who were thus being uselessly employed were set free their services would be at the disposal of the civil population, or at least some of them could be withdrawn from their present units and employed for the purposes of the further million men who were to be raised. Appeals were now being made in various parts of the country to civilian doctors. He knew of one district in London where only ten days ago a meeting of all the medical men was called on behalf of the British Medical Association, and it was there intimated that it was the desire of the War Office that all medical men under 45 years of age should put their services at the disposal of the army. If that was done there would be a famine of doctors for the civil population. That was a situation which ought not to be allowed to come to pass. It was not only in regard to the field ambulances in this country that he had to direct the attention of the Under Secretary for War. There was a similar situation in regard to field ambulances abroad. It was true that these field ambulances were extremely busy when attacks took place or when our forces had a push against the enemy, but at other times the medical officers attached to these ambulances were largely idle. They had no employment. With regard to base hospitals the situation was the same. There were, in normal times, far too many medical officers for the work which they had to do, and when a period of hard pressure came the services of the medical men were needlessly taken up with clerical work and with surgical dressings, which could quite well be done by those who had no medical qualifications. The sole work of medical men enlisted in the army should be to devote their energies and attention to the care of the sick and the wounded. There were many other details upon which the medical organisation was open to criticism. He was told on authority which he considered good that there were large numbers of specialists who were now being employed for ordinary medical work. All these things constituted a case for inquiry and for reorganisation. The large number of civilian doctors who had gone into the army did not take kindly to red-tape methods. The honourable Member also called attention to the fact that since the beginning of the war there had not been a single meeting of the Medical Advisory Committee.

Mr. TENNANT: By design.

Mr. PRINGLE: That is all the worse. He did not believe that good results could be attained by consulting men singly.

Clerical Work in the Royal Army Medical Corps.

Mr. DOUGLAS HALL said that he must endorse what the honourable Member had said about the uneconomic use of medical men at the front. A great many surgeons out there never did anything but administrative work. There were many medical men there, highly qualified men, who never went near a patient and never went into the operating-room at all. They were simply there as clerks to fill up endless forms and to administer the discipline of the orderlies. He had been five months at the front and had had to do with a great many hospitals. In every hospital there were one or two medical officers who spent nearly all their time in office work. The War Office might consider whether it would not be possible to allocate some of these duties to some officer who had not got the high medical skill which officers of the Royal Army Medical Corps possessed. He thought that anyone who went out to one of our large bases would be surprised at the number of doctors who at one time were doing no work at all, while other places were suffering for want of doctors. He did not know whether that could be avoided, but it seemed to him that there might be some better system for distributing the medical men where they were wanted.

The Government Reply.

Mr. TENNANT (Under Secretary for War) replied: In all the actions that have been taken by the medical authorities in the War Office in the administration of the medical services in the army there have been constant and continuous association and conference with the civil medical services of this country. The closest touch has been kept with the civil medical profession, and when my honourable friend complains that the Medical Advisory Committee has not met I really must say once again that it seems a little absurd to criticise the War Office for not having had formal meetings of the Committee when the members of that Committee are meeting the authorities and those responsible for the administration of the medical services of the army day by day and almost hour by hour. That does seem to me

a charge which it does not lie in the mouth of any honourable Member to make.

Mr. PRINGLE: What is the use of having the Committee?

Mr. TENNANT: I do not follow the observation. My honourable friend says that there ought to be fewer medical men in the field ambulances. I hope my honourable friend will recognise that it is not only desirable but essential that there should be a sufficiently strong professional medical element with each field ambulance. That must be admitted as a necessity. If field ambulances should be happily out of work and at rest, not tending the wounded, then naturally enough the doctors and the professional element are also, as it were, at rest. It is a little like the soldiers at the front who have so many days in the trenches and so many days in reserve. It is not a very unnatural circumstance or an improper fact that doctors now and again do get that amount of rest. I have been in communication with the Army Medical Department recently and have discussed these matters with them. I suggested, and the suggestion was received very well by my medical advisers, that during periods of lesser operations the actual professional element might be reduced somewhat further than it is at the present time, so as to allow some of the officers to be more fully occupied with medical cases and so relieve the strain of which my honourable friend complains. He complained also, and the honourable Member for the Isle of Wight (Mr. Douglas Hall) joined in this complaint, that there was a good deal of unskilled work, clerical work, and other duties undertaken by highly skilled and trained medical men which might be done by clerks. That has often been suggested and I have made it my business to inquire whether really clerks could do the work suggested. I am assured that the filling in of forms, which my honourable friend has called unskilled work, could not really be undertaken, shall I say, by stockbrokers' clerks or bank clerks, because it requires real professional knowledge to deal with them.

Mr. DOUGLAS HALL: I did not refer to ordinary clerks. I thought it might be done by men drawn from other branches of the service.

Mr. TENNANT: I am assured by the authorities that is really not so, inasmuch as the forms contain complicated medical details, and to deal with them requires knowledge acquired by training in hospitals and clinical work. But I will return to the charge and see whether to some degree the elimination of the doctor from the form-filing work cannot be achieved. I want to say this about the alleged deficiency of medical men for the civilian population in this country owing to the army having taken so many doctors. My figures are rough, and I do not wish to be bound by them. But, roughly speaking, there are 36,000 doctors on the Register in this country, and of these only about 30,000 are in actual practice. Of the 30,000 we have taken 10,000, or one-third. That leaves 20,000 for the civil population. I would not say that the whole of these 20,000 are doing no sort of work for the army, because many do part-time work for it in their respective localities. But they really are not servants of the State. I am informed in France—this is unofficial information—that instead of taking one-third of the doctors in the country for the army, as we have done, the French Government have taken two-thirds, or just double, and as soon as they take a man they send him straight away from the place in which he practises and put him into a unit some distance away in order that they may claim the whole of his time.

Mr. PRINGLE: Is it not the case that the French War Office has reorganised its medical service recently?

Mr. TENNANT: I am afraid that I cannot answer that. I daresay they have tried to, but I do not think that that necessarily involves my statement being inaccurate. I do not know whether my honourable friend suggests that it does.

Mr. PRINGLE: I think that it might modify it.

Mr. TENNANT: I want my honourable friend to realise that we have a Medical War Committee which sits constantly in particular areas to see whether there is or is not any real shortage of doctors for the civil population of a particular area. These areas we call for our purposes prescribed areas. In these areas no doctor is taken for the army. That Committee sits quite constantly. I do not know whether there is any other point of detail which my honourable friend raised and with which I have not dealt. But, generally speaking, I should like to say this, that I could not help being a little surprised at my honourable friend's tone in dealing with this subject, because I thought it was not only a matter of common knowledge, but of universal acceptance that the medical services during this war have been a really remarkable achievement. I think that the administration of Sir Alfred Keogh, so far from being the object of attack by my honourable friend or any other honourable gentleman in this House, ought really to form the subject of great congratulation to the War Office. I feel that myself. I feel that the administration of Sir Alfred Keogh is deserving of the highest praise, and I believe that my honourable friend the Member for the Isle of Wight will bear that out.

Mr. DOUGLAS HALL: I beg to repudiate any suggestion that I ever attacked Sir Alfred Keogh.

Mr. TENNANT: I meant the administration. I never for a moment suggested that my honourable friend had attacked Sir Alfred Keogh.

Mr. DOUGLAS HALL: I never attacked him. I only suggested improvements in the clerical work.

Mr. TENNANT: I only said that I thought the honourable Member in his great knowledge and administrative experience at the front would agree with me that the administration of Sir Alfred Keogh was worthy of admiration. I ask the honourable Member to say "Yes" or "No."

Mr. DOUGLAS HALL: I understood that Sir Arthur Sloggett was in control in France.

Mr. PRINGLE: That is not the impression out there.

Mr. TENNANT: I do not mind that. I do not wish to detract at all from Sir Arthur Sloggett. I think the combined administration of these two men is a matter for admiration rather than for attack.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

DUNN, J. E., L.R.C.P. Edin., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Preston (West) District of the county of Lancaster.

HUEY, J. M., M.B., Ch.B. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Millom District of the county of Cumberland.

MACKEITH, JOHN, M.B. Glasg., has been appointed Medical Officer to the Tuberculosis Department at the Central London Throat, Nose, and Ear Hospital.

WEBBER, W. W., L.R.C.P. Edin., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Crewkerne District of the county of Somerset.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ABERDEENSHIRE INSURANCE COMMITTEE.—Medical Practitioner for the District of Crathie and Braemar, Upper Deeside.

BIRKENHEAD BOROUGH HOSPITAL.—Junior House Surgeon. Salary £180 per annum, with board and laundry.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—House Surgeon. Salary £200 per annum, with board and residence.

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BURTON-UPON-TRENT COUNTY BOROUGH.—Temporary Assistant Medical Officer. Salary £300 per annum.

BURY INFIRMARY.—Senior House Surgeon. Salary £250 per annum, with board, residence, and washing. Also Junior House Surgeon. Salary £150 per annum, with board, residence, and washing.

CROYDON GENERAL HOSPITAL, London-road, Croydon.—House Surgeon. Salary as arranged, with residence, board, &c.

DERBYSHIRE HOSPITAL FOR SICK CHILDREN.—Female Resident Medical Officer for six months. Salary £200 per annum.

HEREFORD COUNTY AND CITY ASYLUM.—Assistant Medical Officer. Salary £250 per annum, with board, lodging, and washing.

KING'S LYNN, 2/2ND SOUTH MIDLAND MOUNTED BRIGADE FIELD AMBULANCE.—Medical Officers.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with apartments and board.

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PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £240 per annum, with board, residence, and washing.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Surgeon for six months. Salary £100 per annum, with board, residence, and washing.

ROYAL EYE HOSPITAL, Southwark, S.E.—House Surgeon. Salary at rate of £150 per annum.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board and residence.

SHEFFIELD ROYAL INFIRMARY.—Resident Medical Officer. Salary £100 per annum, with board and residence. Also Resident Surgical Officer. Salary £140 per annum, with board, residence, &c.

SHREWSBURY DISPENSARY.—Medical Practitioner to look after Patients of Medical Officer serving with the Army.

WHITCHURCH, NEAR CARDIFF, WELSH METROPOLITAN WAR HOSPITAL.—Resident Physician.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Female House Surgeon. Salary £150 per annum, with board, apartments, and washing.

WORCESTER COUNTY AND CITY ASYLUM, Powick.—Junior Assistant Medical Officer. Salary £250 per annum.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Lytham, in the county of Lancaster; at Edinburgh (North); and at Edinburgh (South).

Births, Marriages, and Deaths.

BIRTHS.

ALLAN.—On Dec. 20th, 1915, at East Mount, Barrow-in-Furness, the wife of B. Allan, F.R.C.S. Edin., of a son.

ARKLE.—On Dec. 21st, 1915, at "Bentham," West Derby, Liverpool, to A. S. Arkle, M.R.C.S., and Mrs. Arkle, a son.

EVANS.—On Dec. 21st, 1915, at Goldington-road, Bedford, to the wife of George Jewel Evans, M.R.C.S. L.R.C.P. Lond., of C.M.S. Hospital, Hangchow, China, a daughter.

GUNN.—On Dec. 28th, 1915, at Melrose House, Perth, the wife of J. T. Gunn, F.R.C.S. Edin., Lieutenant, R.A.M.C., attached 18th Brigade, R.F.A., B.E.F., of a son.

HARRISON.—On Dec. 20th, 1915, at De Montfort-street, Leicester, the wife of Captain Everard Harrison, R.A.M.C. (T.), of a daughter.

LOCKHART-MUMMERY.—On Dec. 21st, 1915, at Hyde Park-place, London, W., to Cynthia, wife of Percy Lockhart-Mummery, F.R.C.S. Eng., a son.

LONGRIDGE.—On Dec. 27th, 1915, at Oxford Parade, Cheltenham, the wife of C. J. Nepean Longridge, M.D. Vict., of a son.

MACRAE.—On Dec. 24th, 1915, at St. Peter's Vicarage, Devizes, the wife of Major MacRae, R.A.M.C., of a son.

MANDY.—On Dec. 16th, 1915, at Quarry House, Hythe, Kent, the wife of P. S. Mandy, M.R.C.S., of a daughter.

OLLERENSHAW.—On Dec. 22nd, 1915, at Palatine-road, Manchester, the wife of Robert Ollerenshaw, F.R.C.S. Eng., Captain, R.A.M.C. (T.), of a son.

MARRIAGES.

BAILEY—TENNANT.—On Dec. 22nd, 1915, at Holy Trinity Church, Lambeth, Bernard Francis Bailey, Lieutenant, R.A.M.C., to Margot, eldest daughter of Mr. and Mrs. David Tennant, of Glenconner, Kenilworth, Cape Colony.

BROWN—MENZIES.—On Dec. 20th, 1915, at St. Mary Abbots, Kensington, Lieutenant L. Graham Brown, R.A.M.C., to Margaret, only daughter of Mr. Alexander Menzies, of Lankat Estate, Sumatra, and of Mrs. Stephens, of Murrayfield-road, Edinburgh.

FLEMING—MCELROY.—On Dec. 23rd, 1915, at St. Charles's, Eagle-street, W., Alexander Fleming, F.R.C.S. Eng., to Sara Marion, daughter of Bernard McElroy, of Leigherntain, Killala, co. Mayo.

MESSENGER—WOOD.—On Dec. 22nd, 1915, at the Church of St. Mary the Virgin, Yatton, Henry Leslie Messenger, L.R.C.P. Lond., M.R.C.S., L.D.S., to Lily, younger daughter of Mr. and Mrs. J. G. Wood, of Westfield, Yatton, Somerset.

DEATHS.

FOX.—On Dec. 25th, 1915, at Heriot-row, Edinburgh, Charles Henry Fox, M.D. St. And., formerly of Brislington, Somerset, aged 78 years.

POLLOCK.—On Dec. 19th, 1915, at Corbeath, Dumfries, Colonel C. F. Pollock, R.A.M.C., aged 71 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, London.
Manual of Anatomy, Systematic and Practical, including Embryology. By A. M. Buchanan, M.A., M.D., F.R.F.P.S. Glasg. Third edition. Price 21s. net.

BLACKWOOD, WILLIAM, AND SONS, Edinburgh and London.
Diary of a Nursing Sister on the Western Front. 1914-1915. Price 5s. net.

CHURCHILL, J. AND A., London.
Catalysis and its Industrial Applications. By B. Jobling, A.R.C.Sc., B.Sc., F.C.S. Price 2s. 6d. net.

COLLINGRIDGE, W. H. AND L., London.
Roses and Their Cultivation. By T. W. Saunders, F.L.S. Price 3s. 6d. net.
The Order of the Hospital of St. John of Jerusalem and its Grand Priory of England. By H. W. Fincham. With a Chapter on the Present Day Work of the Order. By W. R. Edwards. Price 6s. net.

HILL PUBLISHING CO., Pearl-street, New York, and Bouverie-street, London.
Experimental Organic Chemistry. By James F. Norris, Ph.D. Price 5s. 3d net.
Food Analysis. By A. G. Woodman. Price 12s. 6d. net.
American Sewage Practice. Vol. I.: Design of Sewers. Vol. II.: Construction of Sewers. By L. Metcalf and H. P. Eddy.

KING, P. S., AND SONS, LIMITED, London.
The Rise of Rail Power in War and Conquest, 1833-1914. By E. A. Pratt. Price 7s. 6d. net.

Notes, Short Comments, and Answers to Correspondents.

HEALTH AND SANITATION IN CYPRUS.

UNUSUAL interest attaches to the Cyprus Blue-book report for 1914-15, recently presented to Parliament, in view of what has happened since the outbreak of war. It will be remembered that the island came into the occupation of the British in 1878 by virtue of a treaty made between this country and the Porte, under which Cyprus remained nominally part of the Ottoman Empire. In November, 1914, however, on a state of war being declared between Great Britain and Turkey, the former took steps by proclamation to annex the island, which thus became a British possession. In October last the English Government made an offer to cede the island to Greece, conditional on the participation of the latter in the cause of the Entente Allies, but the proposal came to nothing for the time being, though it may not improbably be revived. The Blue-book report has been prepared by Captain C. W. Orr, Chief Secretary, and a section of it deals with medical and sanitary matters, of which we give the following summary.

The sanitary condition and the general health of the island during the year ending March 31st, 1915, were satisfactory. One case of small-pox occurred in Nicosia in April, 1914, but immediate measures of isolation, quarantine, and vaccination were adopted with the result that the disease did not spread and was limited to this one case. In May, however, the disease again occurred in a mountain village, Alona, having developed in a woman who had returned from a pilgrimage to Jerusalem, but owing to vigorous measures of isolation there were only four contact cases. 7187 vaccinations were performed during the year. 341 cases of enteric fever occurred, 8 of which proved fatal. The disease continues mild as a rule, but there was a severe and sudden outbreak in the month of July in the town of Larnaca, resulting in about 100 cases. There were 13 cases of cerebro-spinal meningitis with 8 deaths, as against 25 cases during the previous year. There is also a reduction in diphtheria, 8 cases with 3 deaths being reported, as against 21 cases in the previous year. Scarlet fever occurred for the first time for many years, there being 6 cases in Larnaca, mild in type.

The antimalarial campaign, begun in 1913 after the visit of Sir Ronald Ross, resulted in a reduction of malarial cases. So far as the campaign was concerned, however, the year was unfavourable, the winter being a mild one favourable for the breeding of mosquitoes, which were found living in wells, &c., during the coldest months of the year. Exceptionally heavy rains also fell during November and December, 1913, and there were heavy and late spring rains in 1914. Notwithstanding these unfavourable conditions, all districts, with the exception of Larnaca, which had an increase of 44 cases, showed a reduction of the returns of the previous year, the total decrease amounting to 720 cases. Generally speaking, the disease takes the benign form, pernicious and malignant cases being rarer. The mortality is very low; details for those attending out-patient dispensaries are wanting, but the returns for diseases and deaths show that there were only 7 deaths out of a total of 365 cases admitted to the hospitals as in-patients—equal to 1·6 per cent.

A more extensive spleen census has been made, and much care and interest has been taken by the medical officers in the examination of children. A total of 26,941 were examined during the months of October, November, and December, 1914, at the end of the malarial season; of these, 22,799 were found without enlargement, 3125 were returned with slight enlargement, whilst 792 and 225 had medium and great enlargement of the organ respectively. These figures give a spleen-rate of 15·3, showing a gradual and steady reduction on the rates of previous years.

Under the supervision of the sanitary engineer extensive drainage and other antimalarial measures were carried out in the Larnaca and Famagusta districts. Larvicide substances were extensively used throughout the year, and experiments in these substances were continued. It has been found that the addition of a small quantity of the substance hitherto used—a compound of crude carbolic, caustic soda, and resin—to crude oil causes rapid spreading and very much increases its efficiency. Two of the chief difficulties encountered in the work of mosquito reduction are due to wells and cesspits, both of which are prolific breeding-places. Cyprus has, generally speaking, a deficient rainfall, and wells have to be used to supplement the supply for domestic purposes. The difficulties of finding in Cyprus, particularly in the large towns, adequate supplies of water suitable for domestic

use form an obstacle to introducing a system of reservoirs and filter-beds with pipe distribution, which might otherwise mitigate the evils arising from the use of wells and cesspits.

The Nicosia General Hospital has accommodation for 53 beds. 1175 patients were admitted during the year, and there were 41 deaths. The number of out-patients was 5832. Twenty cases of consumption were admitted, with 8 deaths; these patients were accommodated in a detached building well removed from the general wards, and it has proved of great service in dealing with cases amongst the poor and destitute of the town of Nicosia. The maternity wards treated 27 cases during the year. The training of native midwives, who are taken from all parts of the island, has been a marked and very beneficial feature of these wards. A large amount of surgical work was carried out in the hospital during the year, the operations performed numbering 409, a large proportion being for abdominal cases. The hospital is being equipped with electric light and an X ray apparatus is being set up. The district hospitals of Larnaca, Limassol, Paphos, Famagusta, and Kyrenia carried out excellent work during the year. A new building is being erected at Famagusta, rendered necessary by the extensive development of the town and port. The hospital at Larnaca has been greatly improved; the wards are now tiled throughout and thus rendered much more sanitary than with the old wood flooring, which was difficult to keep clean.

The number of inmates at the Leper Farm is now 97. There were 12 admissions during the year and 10 deaths. All classes and stages of the disease are met with in the farm; anæsthetic, tubercular, and mixed varieties exist. At the lunatic asylum the inmates number 92. During the year 25 cases of insanity were admitted, 9 died, and 8 were discharged cured or relieved. Criminal lunatics have now been transferred from the prisons of the island to the asylum. All kinds of mental diseases are met with, but dementia and epilepsy are commonest.

The number of samples analysed at the Government Laboratory was 1759, an increase of 584 over the previous year. There was an increase of 528 in the total of samples of food analysed, and the percentage of adulterated samples showed an advance of from 13·8 to 15·7, due mainly to the adulteration of pepper and curdled milk. The percentage of adulterated samples of flour has decreased and the quality of flour improved, although several samples were found unfit for food. Of 65 samples of curdled milk examined 42 were found to be adulterated with alum. Alum retards digestion, is an astringent, a purgative in large doses, and an emetic in repeated doses; taken internally in doses of more than 15 grains it is injurious to health. It is only added to curdled milk to make the latter set quickly, and its addition is unnecessary; since these analyses were instituted the makers of curdled milk have practically ceased to add alum. Besides the work of analysing samples and making preparations and giving expert evidence in criminal cases, the Government analyst gave during the year a course of 104 lectures and demonstrations in elementary theoretical and practical chemistry and the allied sciences. Five of the pupils passed the examination and were awarded the Government certificate.

The absolute mean of the thermometer for the year was 65·21° F., as compared with 65·24° in the previous year; this is little less than the mean of the last 15 years. The winter was an exceptionally warm one, as the thermometer in the screen in Nicosia never fell below the freezing point, and no snow was observed on the Kyrenia hills. The lowest temperature at Nicosia was 35°, and the highest 103°. The average rainfall for the whole island was 21·91 inches, as against 24·66 during the previous year; this shows an improvement, the average for the past ten years having been only 19·79. There can be little doubt that the gradual re-afforestation carried on by the Forest Department, and otherwise since the occupation, is having a beneficial effect on the rainfall and atmospheric conditions of the island.

MIDWIVES' GRIEVANCES.

To the Editor of THE LANCET.

SIR,—There are two matters affecting midwives about which a good deal of clamour has arisen, and although no mention has been yet made of them in your columns, real grievances appear to exist. Pressure is being exerted on midwives to notify to the medical officer of health or to maternity centres the names of patients who book with them. This cuts at professional confidence and may have the result of militating against the early booking which is so essential for antenatal care. It looks as though an attempt is even being made to bluff midwives into thinking that this notification is obligatory. The second grievance concerns the inspection of lying-in homes, which duty the London County Council has recently proposed to delegate to the borough councils, and has actually deputed for the present to their Public Control instead of their Health Department. The status of the registered midwife is scarcely likely to be raised by coming, along with nuisances and eating-houses, under the jurisdiction of the sanitary inspector. It is good that the Central Midwives Board has reiterated its request to the London County Council to keep the inspection in its own hands.

I am, Sir, yours faithfully,

Dec. 27th, 1915. FAIR PLAY.

MR. BYFIELD'S CALCULUS.

To the Editor of THE LANCET.

SIR,—Dr. Thomas Fuller records the following of his friend, Mr. Nicholas Byfield, which I think should find a place in medical literature. Mr. Byfield was rector of Isleworth, in Middlesex, where he preached five times every week and was actively employed in parish work till five weeks before his death, "notwithstanding there was a stone in his bladder, which, being taken out, weighed, and measured after his death, was found of these prodigious proportions: 1. In weight, thirty-three ounces and more. 2. In measure about the edge, fifteen inches and a half. 3. In measure about the length, thirteen inches and above. 4. In measure about the breadth, almost thirteen inches. It was of a solid substance to look upon, like a flint." The dimensions, weight, and the description of the stone originally appeared in Dr. Gouge's preface to the posthumous writings of Mr. Byfield, which were probably published near the end of the fifth decade of the seventeenth century.

I am, Sir, yours faithfully,

Dublin, Dec. 18th, 1915. GEORGE FOY.

VOLTAIC VERTIGO.

To the Editor of THE LANCET.

SIR,—Your Paris correspondent alludes in connexion with shell-shock to "voltaic vertigo" as though the meaning of this term is a matter of common knowledge. A reference to a recent medical dictionary gives "an inclination of the head toward the shoulder on the side of the positive pole when a galvanic current is applied to the vestibular fibres of the eighth nerve." This definition does not quite fit the context. Bárány has used the term galvanic vertigo, but without further defining his meaning. Perhaps one of your readers could help.

I am, Sir, yours faithfully,

Dec. 27th, 1915. ACUSTICUS.

T. D., M.R.C.P.E.—A number of severe cases of pulmonary and even laryngeal tuberculosis show a tendency to rapid improvement when removed from the source of infection and placed under tolerably healthy conditions. One such case, when in harmony with his previous experience, may rightly help to convince the administrator of the value of a particular remedy, but this personal kind of conviction cannot be transmitted.

J. H., M.D.—We agree that the causation of high pulse tension is often obscure, but not that high tension is insufficiently recognised as a cause of sudden death. Our correspondent's view of apoplexy or cardiac failure as a digestive reflex would require more support than his bare assertion.

F. W. P., L.R.C.P.—This is hardly a time at which any form of strike can be recommended.

ERRATUM.—In an annotation entitled "The Treatment of Cerebro-spinal Syphilis by Mercurialised Serum," which appeared in THE LANCET of Dec. 18th, 1915, p. 1361, the quantity of albuminate of mercury which can be held in solution by 18 c.c. of human serum is given as 1 grm. and the dose recommended for injection as 1/50 or 1/25 grm. Grm. is, of course, in each case an error for *grain*. Dr. C. M. Byrne recommended that the dose should be contained in 30 c.c. of serum and normal saline solution.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Dec. 29th, 1915.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. in Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Dec. 23	29·380	S.W.	...	69	49	44	43	44	Fine
,, 24	28·910	S.W.	0·30	62	52	44	49	49	Cloudy
,, 25	28·890	S.	0·15	65	50	47	49	50	Raining
,, 26	29·314	S.W.	0·14	63	50	44	45	47	Fine
,, 27	29·340	S.W.	0·03	73	54	44	45	46	Raining
,, 28	29·810	S.W.	0·55	69	50	44	44	45	Cloudy
,, 29	29·640	E.	...	50	50	45	46	47	Overcast

Medical Diary for the ensuing Week.

SOCIETIES.

ROENTGEN SOCIETY, Institution of Electrical Engineers, Victoria Embankment, W.C.

TUESDAY.—8.15 P.M., General Meeting. Paper:—Mr. J. H. Gardiner (President): Some Observations upon the Occurrence of Uranium. Demonstrations will be given by Mr. P. J. Neate, Mr. C. A. Schunk, Dr. N. S. Finzi, and Dr. Harvey.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out patients (Dr. A. G. Auld); Surgical Out patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles) Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

For further particulars of the above Lectures, &c., see Advertisement Pages.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1915 were given in THE LANCET of Dec. 25th, 1915.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1915 will be ready shortly. Bound in cloth, gilt lettered, price 16*s.*, carriage extra.

Cases for binding the half-year's numbers are now ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 4*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

ALTERATION OF INLAND SUBSCRIPTION RATES.

OWING to the alteration in the Inland Newspaper Postal rate, the postage on each copy of THE LANCET will in future be 1*d.*, and sometimes 1½*d.*

The revised Inland Subscription rates are:—

One Year	£1	3	3
Six Months	0	13	8
Three Months	0	7	0

The rates for the Colonies and Abroad (thin paper edition) will be as usual:—

One Year	£1	5	0
Six Months	0	14	0
Three Months	0	7	0

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

THE Secretary of the War Office has issued the following order:—

The public are informed that on and after Saturday, November 6th, newspapers, magazines, books, and other printed publications (other than trade circulars) will not be sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. Persons desiring to send newspapers, &c., to neutral European countries should, therefore, give their orders for execution to publishers or newsagents who have obtained such permission.

The Publisher of THE LANCET has obtained the required permission of the War Office, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

The following magazines, journals, &c., have been received:—Archives of Internal Medicine, Calcutta Medical Journal, American Journal of Obstetrics, Interstate Medical Journal, Revue d'Hygiène, St. Thomas's Hospital Gazette, Journal of Dermatology, American Medicine, La Clinica Ostetrica, Journal of Tropical Medicine and Hygiene, Review of Neurology and Psychiatry, Albany Medical Annals.

Communications, Letters, &c., have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Lieutenant J. W. Adamson, R.A.M.C.; Dr. Robert Armstrong Jones, Woodford Bridge; Anglo-American Pharmaceutical Co., Lond.; Dr. Blair Aitken, Ripon; Dr. M. Ap Iwan, Junin.

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